KEPCO KOREA ELECTRIC POWER CORPORATION
BYLONG AUSTRALIA

BYLONG COAL PROJECT

Environmental Impact Statement

Supplementary Response to Submissions

August 2016

1

Main Report &
Appendices A-I

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

WorleyParsons
resources & energy

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BYLONG COAL PROJECT

SUPPLEMENTARY RESPONSE TO SUBMISSIONS

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SUPPLEMENTARY RESPONSE TO SUBMISSIONS

for

WorleyParsons Services Pty Limited

1 INTRODUCTION

This section outlines the background of the Bylong Coal Project (the Project) and explains the purpose and structure of this Supplementary Response to Submissions (Supplementary RTS) document.

1.1 BACKGROUND

KEPCO Bylong Australia Pty Limited (KEPCO) owns the Bylong Coal Project (the Project) which is located within the Mid-Western Regional Council (MWRC) Local Government Area (LGA) approximately 55 km to the north-east of Mudgee. The Project involves the construction and operation of a coal mine utilising open cut and underground mining methods to recover up to approximately 6.5 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal for a period of approximately 25 years.

KEPCO submitted an Application for State Significant Development (SSD) Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 23 July 2015 to facilitate the development of the Project (SSD 14_6367).

KEPCO also submitted a Referral to the Commonwealth Department of the Environment (DoE) for the Project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 12 February 2014. The Project was determined to be a 'Controlled Action' under the EPBC Act on 12 March 2014 and would be assessed under the "Bilateral Agreement" between the Commonwealth and NSW Governments.

The NSW Department of Planning and Environment (DP&E) issued the Secretary's Environmental Assessment Requirements (SEARs) for the Project on 23 June 2014 (with minor amendments on 11 November 2014).

The '*Bylong Coal Project Environmental Impact Statement'* (EIS) (Hansen Bailey, 2015) was prepared in accordance with the SEARs and was placed on public exhibition between 23 September 2015 and 6 November 2015.

A total of 383 submissions were received by DP&E during the public exhibition of the EIS.

The '*Bylong Coal Project Response to Submissions*' (RTS) (Hansen Bailey, 2016) was prepared on behalf of KEPCO and submitted to DP&E in March 2016. The document responds to the issues raised in submissions by stakeholders during the public exhibition period.

DP&E provided the RTS to various regulatory agencies seeking any further comments. DP&E received supplementary submissions on the RTS from 11 regulatory agencies, one from a special interest group and one submission from a neighbouring organisation representing a landholder adjacent to the Project. DP&E has subsequently requested KEPCO to provide a response to a number of residual issues raised within the supplementary submissions.

1.2 DOCUMENT PURPOSE

This "Supplementary RTS" report has been prepared by Hansen Bailey Environmental Consultants (Hansen Bailey) on behalf of KEPCO as a consolidated summary of the responses to the additional stakeholder submissions made to DP&E in response to the RTS.

1.3 DOCUMENT STRUCTURE

This document is structured as follows:

- **Section 2** details the supplementary submissions made to DP&E on the RTS and provides reference to the Appendix which contains the detailed responses;
- **Section 3** details the key issues raised in each submission and provides a summary response;
- **Section 4** details a revised management and monitoring summary of new or revised commitments made in this Supplementary RTS; and
- **Section 5** details a summary of the key matters outstanding and conclusion.

Technical specialists involved in the preparation of the EIS and RTS have provided additional expert advice during the preparation of this document. Where applicable and as referenced, this document should be read in conjunction with **Appendix A** to **Appendix M** (and supporting documentation), which provides additional detailed technical information.

2 SUPPLEMENTARY SUBMISSIONS

This section provides an outline of the supplementary submissions received and refers to the relevant responses provided to each stakeholder.

2.1 DEPARTMENT OF PLANNING AND ENVIRONMENT

In letter correspondence dated 6 May 2016, DP&E provided a number of supplementary responses received from stakeholders on the RTS document, seeking further consideration and responses to the residual issues raised in the responses. This included submissions from the following stakeholders:

- Office of Environment and Heritage (OEH);
- Roads and Maritime Services (RMS);
- Mid-Western Regional Council (MWRC);
- Wollar Progress Association (WPA); and
- Department of Trade and Investment – Division of Resources and Energy (DRE).

DP&E also noted KEPCO's outstanding responses to the late Muswellbrook Shire Council's (MSCs) submission on the EIS (dated 15 March 2016) and a requested a response to a separate letter received from OEH (on 14 March 2016). DP&E also indicated in the correspondence that various responses were expected to be received from other stakeholders.

DP&E subsequently provided submissions from the following stakeholder to KEPCO by email on the following dates:

- Email on 10 May 2016:
  - Environment Protection Authority (EPA);
  - Heritage Council of NSW (Heritage Council); and
  - Timnath Pty Limited (Timnath); and
- Email on 12 May 2016:
  - Department of Primary Industries (DPI), comprising comments from both DPI-Water and DPI-Agriculture;
  - DP&E's Groundwater Peer Reviewer (Kalf & Associates (KA)); and
- Email on 31 May 2016:
  - Forestry Corporation of NSW (FCNSW).

Responses to each of these stakeholder submissions are discussed in the above order in the following sections.

In addition to these submissions DP&E has highlighted the requirement for it to consider the various stakeholders concerns in relation to the environmental impacts generated by the open cut component of the Project.

DP&E has indicated that a good level of information is available from KEPCO and other stakeholders in relation to the economic benefits of the open cut component of the Project. Accordingly, a Mine Plan Justification Report - Additional Supporting Information has been prepared for the Project and is included within **Appendix A**.

2.2 OFFICE OF ENVIRONMENT AND HERITAGE

During the period of preparing the RTS, a meeting was held with OEH in Dubbo on 3 February 2016 to clarify issues raised in its submission. As requested by OEH, KEPCO provided revised vegetation mapping within the Project Disturbance Boundary on 12 February 2016. OEH reviewed the revised vegetation mapping and raised additional concerns in undated correspondence received on the 14 March 2016.

With the RTS already largely completed, KEPCO prepared a separate response to OEH's new issues in a letter dated 12 May 2016. No further correspondence has been received from OEH over the matters addressed in this correspondence.

OEH provided a supplementary submission on the RTS in letter to the DP&E dated 3 May 2016 over different matters addressed in previous correspondence.

A meeting was held in Dubbo on 16 June 2016 to discuss the issues raised within OEH's letter dated 3 May 2016 and to further discuss the issues raised in OEH's undated letter received on 14 March 2016.

KEPCO provided a letter to DP&E on 8 July 2016 which responds to OEH's letter of the 3 May 2016 and subsequent discussions held during the meeting on 16 June 2016. A copy of KEPCO's response to OEH's submission is included in **Appendix B**.

The key issues raised by OEH and KEPCO's responses are summarised in **Table 1**.

2.3 ROADS AND MARITIME SERVICES

RMS provided supplementary comments on the RTS in letter to DP&E dated 27 April 2016 noting that their concerns remain in relation to mine commuter road safety. A meeting was held in Mudgee with the RMS, MWRC and DP&E on 23 June 2016 to discuss the items raised in the most recent RMS correspondence.

KEPCO's response to RMS's latest comments, including the outcomes of the meeting in June 2016 is included in **Appendix C**.

Key issues raised by RMS and KEPCO's responses are summarised in **Table 1**.

2.4 MID-WESTERN REGIONAL COUNCIL

MWRC provided supplementary comments on the RTS in letter dated 26 April 2016 to DP&E. MWRC's primary comment was that they do not support the use of a Workforce Accommodation Facility (WAF) for the Project. MWRC's primary justification for not supporting the temporary WAF is simply that the region has previously supported employees for the construction phases of other mining projects in the absence of a WAF.

A meeting was held with the MWRC General Manager on 16 June 2016 to discuss the issues raised in the MWRC letter of 26 April 2016. During this meeting, it was agreed in principle that KEPCO would prepare a draft Development Consent condition for the proposed WAF for MWRC's consideration. This draft Development Consent condition would specify a conditional approval, based on the demonstrated need and assessment for the WAF at the time.

On 20 July 2016, a draft Development Consent condition was reported to the MWRC Ordinary Meeting. MWRC resolved that whilst they continue to support the Project, they do not support the use of a WAF for the Project. MWRC's main reason for not supporting the temporary WAF is simply that the region has previously supported employees for the construction phases of other mining projects in the absence of a WAF.

KEPCO has also been in ongoing discussions with the MWRC regarding the necessary road maintenance agreement for the Project in addition to the Voluntary Planning Agreement which has been agreed.

KEPCO has prepared a response to MWRC's latest submission for DP&E's consideration. A copy of this response is included in **Appendix D**.

The key issues raised by MWRC and KEPCO's responses are summarised in **Table 1**.

2.5 WOLLAR PROGRESS ASSOCIATION

A further submission was received from the WPA in letter dated 26 April 2016 raising concerns with the RTS.

KEPCO has prepared a response to WPA's correspondence which is included in **Appendix E**.

Key issues raised by the WPA and KEPCO's responses are summarised in **Table 1**.

2.6 DEPARTMENT OF INDUSTRY – DIVISION OF RESOURCES AND ENERGY

Letter correspondence from DRE dated 28 April 2016 noted that they are "*satisfied that the Proponent has addressed all of the comments made*". No further response is required for this submission.

2.7 MUSWELLBROOK SHIRE COUNCIL

The RTS submitted to DP&E on 23 March 2016 addressed comments received from agencies and other stakeholders during the exhibition of the EIS. Due to the time of receipt of MSC's comments (letter dated 15 March 2016), the comments were not addressed in the RTS.

Accordingly, this Supplementary RTS addresses MSC's comments in their letter dated 15 March 2016. The response prepared by KEPCO has also been informed by discussions held during a meeting with the MSC on 26 May 2016.

A copy of the response to MSC's submission on the EIS is included in **Appendix F**.

Key issues raised by MSC's submission on the EIS and KEPCO's responses are summarised in **Table 1**.

On 11 August 2016, DP&E provided KEPCO with a supplementary response letter from MSC dated 9 August 2016 which raises similar concerns to its previous correspondence. KEPCO has appropriately responded to MSCs concerns (see **Appendix F**) regarding the distribution of the workforce and mine support services (within the Local Area) and also the existing road safety matters which are present on the Bylong Valley Way within the MSC LGA.

KEPCO maintains that the assumptions utilised within the revised Traffic and Transport Impact Assessment (TTIA) remain appropriate with the Project's workforce to predominantly reside within the MWRC LGA.

It is noted that the road safety matters on the Bylong Valley Way as raised by MSC (and as similarly identified within KEPCO's recently completed Road Safety Audit) are issues that exist on the current road network and are of concern with or without the Project. This is particularly the case since the Bylong Valley Way is a well utilised tourist route and has dominant use (presumably by tourists) on weekends. This is demonstrated in the crash data which provides that 50% of the crashes on Bylong Valley Way have occurred on weekends and a substantial proportion of these have involved motorcycles (refer to Section 2.7 of the revised TTIA).

The revised TTIA includes the relevant assessments of the intersection and mid-block capacity performance on the Bylong Valley Way in accordance with the *RMS Guide to Traffic Generating Developments and Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis guidelines* (RMS Guide to Traffic Generating Developments). The RMS Guide to Traffic Generating Developments provides categories for the level of service for an intersection or mid-block capacities with further work required for developments that exceed the various thresholds. The assessments completed for the Project have confirmed that the Bylong Valley Way and associated intersections will continue to perform with a good level of service with adequate spare capacity. It is noted that should 100 percent of the Project-related vehicles travel via Bylong Valley Way to the east, this road and associated intersections would continue to perform with a good level of service with adequate spare capacity.

In light of the above, MSCs concerns in relation to solely the Project's contribution to existing traffic flows and subsequent road safety matters on the Bylong Valley Way are not justified. Further, the revised TTIA has confirmed that the Project's contribution to the Bylong Valley Way will not detrimentally impact upon the level of service to the road or associated intersections.

2.8 ENVIRONMENT PROTECTION AUTHORITY

The EPA provided DP&E with letter correspondence dated 9 May 2016 raising queries over how their earlier submission had been responded to within the RTS.

KEPCO has prepared a response to EPA's comments on the RTS which is included in **Appendix G**.

Key issues raised by the EPA and KEPCO's responses are summarised in **Table 1**.

On 17 August 2016, DP&E provided further comments received from the EPA. KEPCO proposes that the additional items raised in EPA's latest correspondence be discussed during a meeting to be arranged by KEPCO with EPA and DP&E.

2.9 HERITAGE COUNCIL OF NSW

The Heritage Council provided DP&E with supplementary comments on the RTS in their letter dated 9 May 2016.

KEPCO has responded to the Heritage Council's issues in letter dated 3 June 2016.

A copy of KEPCO's response to the Heritage Council's submission on the RTS is included in **Appendix H**.

Key issues raised by the Heritage Council in their submission and KEPCO's responses to these are summarised in **Table 1**.

2.10 TIMNATH PTY LIMITED

Timnath Pty Limited provided a submission on the RTS to DP&E dated 6 May 2016 highlighting their concerns raised in their previous correspondence.

KEPCO prepared a response to the comments from Timnath Pty Limited in letter to DP&E dated 6 May 2016. A copy of KEPCO's response is included in **Appendix I**.

Key issues raised by Timnath Pty Limited and KEPCO's response to these issues are summarised in **Table 1**.

2.11 DEPARTMENT OF PRIMARY INDUSTRIES – WATER

DPI-Water provided a submission on the RTS dated 12 May 2016 which raised various matters from its previous correspondence and outstanding queries within the RTS.

KEPCO held a meeting with DPI-Water on 27 May 2016 to present the results of the borefield pump testing program as explained within the RTS document and to discuss the latest DPI-Water submission dated 12 May 2016. A further meeting was held with DPI-Water via phone conference on 25 July 2016 to provide an update on the additional groundwater modelling which had been undertaken to address DPI-Water's comments.

KEPCO has prepared a response to DPI-Water's latest submission including the feedback gained through the various meetings held. The response to DPI-Water is supported by a technical report prepared by AGE Consultants which describes the latest groundwater modelling which has been undertaken to address DPI-Water's comments. The response also contains an updated water balance prepared by WRM utilising the revised groundwater inflows to the mining areas from the AGE's latest groundwater model predictions. A copy of the letter responding to DPI-Water's comments is included in **Appendix J**.

Key issues raised by DPI-Water and KEPCO's responses are summarised in **Table 1**.

2.12 DEPARTMENT OF PRIMARY INDUSTRIES – AGRICULTURE

DPI-Agriculture provided a supplementary submission on the RTS to the DP&E in letter dated 12 May 2016 which commented further on various matters raised in previous correspondence.

Since the receipt of DPI-Agriculture's comments, two meetings have been held with DPI-Agriculture (on 27 May 2016 and the 17 June 2016) to discuss the outstanding matters identified in their correspondence. The outcomes of these meetings have informed the preparation of KEPCO's response.

During the meeting held on 17 June 2016, DPI-Agriculture requested that a draft response to their comments be provided to ensure that the final response addressed all matters. A draft response to the submission dated 12 May 2016 was provided to DPI-Agriculture and DP&E on 5 July 2016. DPI-Agriculture subsequently provided letter dated 20 July 2016 which provides further clarifications on their comments which have been addressed within this response.

KEPCO's letter responding to DPI-Agriculture's comments on the RTS is included in **Appendix K**. Key issues raised by DPI-Agriculture and KEPCO's responses are summarised in **Table 1**.

2.13 DP&E GROUNDWATER INDEPENDENT PEER REVIEW

DP&E commissioned KA to complete a review of the groundwater assessment for the Project. KA's letter dated 5 May 2016 provides a number of comments which require consideration by KEPCO's groundwater consultants. KA also suggests the requirement for a Model Audit to be completed on the AGE groundwater model files.

A meeting was held on 2 June 2016 with representatives from KEPCO, WorleyParsons, DP&E, KA, Hansen Bailey, AGE and HydroSimulations to discuss the requirement for the Model Audit and to refine the scope of work required.

On 7 June 2016, a Model Audit Methodology report prepared by HydroSimulations was sent to DP&E for review and approval. DP&E provided support for the methodology from KA on 13 June 2016. DP&E also provided further comments from KA on 16 June 2016 which were to be addressed within the Model Audit.

A copy of the HydroSimulations Model Audit Report is provided in **Appendix L**. AGE has also addressed other comments from KA in its technical report provided within **Appendix J**. Key issues raised by KA and KEPCO's responses to these issues are summarised in **Table 1**.

2.14 FORESTRY CORPORATION OF NSW

FCNSW provided letter dated 30 May 2016 to DP&E highlighting outstanding matters raised in its previous correspondence that they believe were not fully addressed within the RTS.

KEPCO's response to FCNSW's latest letter in relation to the RTS is included in **Appendix M**. Key issues raised by FCNSW and KEPCO's responses to these issues are summarised in **Table 1**.

3 SUMMARY OF ISSUES AND RESPONSES

***Table 1** provides a summary of the issues raised in each submission and the proposed resolution of each issue.*

Table 1
Summary of Key Issues Raised and Response Summary

Issue Ref	Issue	Appendix	Response Summary
Department of Planning and Environment			
1.	Biodiversity and Aboriginal Heritage	**Appendix B**	• See response to OEH issues at **Section 2.2**.
2.	Traffic and Transport	**Appendix C** **Appendix D** **Appendix E** **Appendix F**	• See responses to RMS, MWRC, WPA and MSC issues within **Sections 2.3**, **2.4**, **2.5** and **2.7**. • Meetings have been held with RMS and MWRC to discuss the issues raised relating to traffic and transport.
3.	Mine Plan Justification	**Appendix A**	• KEPCO has prepared a Mine Plan Justification Report Supplementary Information which provides further information for DP&E's consideration by comparing the environmental implications of the Project compared to a Hypothetical Underground Only Scenario (See **Appendix A**). • KEPCO has advised that an underground only scenario is not a viable option for the Project. • The hypothetical underground only scenario provides a reduced project disturbance footprint compared to the Project, however material environmental risks would remain for a hypothetical underground only scenario, such as management of coal processing waste, visual impacts, mine water and long term rehabilitation liabilities.

Issue Ref	Issue	Appendix	Response Summary
Office of Environment and Heritage			
1.	Ecology – Offset Area 5	**Appendix B**	• DP&E and OEH have accepted Offset Area 5 as an offset area for the Project. • DP&E and OEH confirmed that the Biodiversity Offset Strategy as it has been prepared for the RTS utilising preliminary information is an acceptable approach for the assessment process and that the full complement of surveys can be conducted as a post approval. • KEPCO will continue to liaise with DP&E and OEH to ensure that the correct number and type of credits are retired for the Project.
2.	Ecology – Matters for Further Consideration	**Appendix B**	• There have been three matters for further consideration identified as part of the assessment, including impacts to: Bylong River (fourth order stream) Box Gum Woodland and Derived Native Grassland, and Regent Honeyeater. • Given that the impacts to these three assessed matters for further consideration are not considered to be '*complicated or severe*', it is considered unnecessary for the Project to provide additional offsets, supplementary measures or other actions. • The current offset areas provide the required ecosystem and species credits as calculated within the BAR for direct impacts within the Project Disturbance Boundary.
3.	Ecology – Variation to Offset Rules – Ecosystem Credits	**Appendix B**	• An additional Fuzzy Box Woodland Offsets Area has been identified which comprises approximately 2.35 ha of woodland and approximately 14.39 ha of grassland which conforms to the Fuzzy Box Woodland community. • This additional offset area will provide the required deficit in ecosystem credits currently presented within the Biodiversity Offset Strategy.

Issue Ref	Issue	Appendix	Response Summary
			• KEPCO will continue to engage with OEH in an endeavour to retire the required ecosystem credits for the Fuzzy Box Woodland community.
4.	Ecology – Variation to Offset Rules – Species Credits	**Appendix B**	• Based on the revised habitat mapping utilising the most contemporary plant community types (PCTs) presented within the latest version of the OEH Threatened Species Profile Database, calculations have shown that the Project's offset areas will generate an excess of credits required for impacts to Regent Honeyeater habitat. • KEPCO will continue to liaise with OEH to ensure that there is agreement on the method utilised for mapping Regent Honeyeater habitat within the Project Disturbance Boundary and offset areas according to the latest OEH Threatened Species Profile Database.
5.	Ecology – Cliffs	**Appendix B**	• As per commitment nine of the RTS, KEPCO has committed to minimising adverse impacts on Cliff 5 (C5) by potentially reducing the length of Longwall 106. • As recommended by OEH, KEPCO will include provisions within the Biodiversity Management Plan (BMP) to undertake searches of potential roost sites at prominent cliffs within and adjacent to the Subsidence Study Area (C5, C6, C8 and C9) in conjunction with monitoring of cave-dwelling microbats.
6.	Ecology – Category 2 and Category 3 Grassland Mapping	**Appendix B**	• KEPCO provided a response to OEH's letter dated 14 March 2016 in correspondence dated 12 May 2016. • During meeting on 16 June 2016, Commonwealth Department of the Environment (DoE) requested the inclusion of grassland conforming to category 2 and category 3 grasslands within the mapped extent of Box Gum Woodland and Derived Native Grassland.

Issue Ref	Issue	Appendix	Response Summary
			• The revised mapping of the EPBC Act Box Gum Woodland and Derived Native Grassland community reflecting DoE's requests illustrates approximately 68 ha of Category 2 grasslands and 43 ha of Category 3 grasslands. • This revised mapping illustrates a total of approximately 249 ha of EPBC Act Box Gum Woodland and Derived Native Grassland community within the Project Disturbance Boundary as per DoE's request.
7.	Aboriginal Heritage – Mitigation Strategies	**Appendix B**	• OEH accept the proposed mitigation strategies in relation to Aboriginal Heritage which will be further developed through the staged development of the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP) for the Project in consultation with the Registered Aboriginal Parties (RAPs) including the Warrabinga Wiradjuri #4 Native Title Claimants.
8.	Aboriginal Heritage – Aboriginal Ochre site OQ001 – Gender Importance	**Appendix B**	• Accounting for the recent findings by Gunn (2016), RPS do not consider this geological feature to have a specific gender importance.
9.	Aboriginal Heritage – Aboriginal Ochre site OQ001 – Gunn Additional Findings	**Appendix B**	• As per item 11 below.
10.	Aboriginal Heritage – Aboriginal Ochre site OQ001 – AHIMS Examination	**Appendix B**	• The information provided by OEH is noted. As per item 11 below.
11.	Aboriginal Heritage – Aboriginal Ochre site OQ001 – Adequate Documentation	**Appendix B**	• KEPCO proposes to undertake a specialist study which takes into account all of the recommendations presented in Gunn (2016). • The specialist study will be undertaken in the post-approval stage of the Project during the staged preparation of the AACHMP for the Project. The AACHMP will outline the proposed staged approach to this study.

Issue Ref	Issue	Appendix	Response Summary
12.	Aboriginal Heritage – Archaeological Context and Accumulative Harm to Aboriginal Sites	**Appendix B**	• Noted that OEH does not have set guidelines for assessing cumulative impacts for Aboriginal heritage. • KEPCO has committed to adhering to the recommendations from OEH to offset the cumulative impact (as assessed by OEH).
13.	Aboriginal Heritage – Archaeological Significance Assessment (Scientific)	**Appendix B**	• Noted.
14.	Aboriginal Heritage – Regional Impacts	**Appendix B**	• The specialist rock art study and the assessments of select Biodiversity Offset Areas for the Project will be undertaken as a component of the staged development of the AACHMP in consultation with OEH and the RAPs including the Warrabinga Wiradjuri #4 Native Title Claimants. • KEPCO will prepare the methodologies for both these assessments in accordance with OEH guidelines and advice.
Roads and Maritime Services			
1.	Road Safety Audit	**Appendix C**	• KEPCO commissioned a Road Safety Audit of the primary roads to be utilised by Project-related traffic, including Bylong Valley Way and Wollar Road which has been completed and provided as part of this Supplementary RTS. • Various road works are currently being undertaken or are proposed by MWRC and MSC to improve the safety on the road network. • KEPCO is in ongoing discussions with MWRC and MSC regarding the road safety improvements required on the regional road network and KEPCO's contribution to the remediation of the road safety remediation works.

Issue Ref	Issue	Appendix	Response Summary
2.	Mine Commuter Road Safety	**Appendix C**	• KEPCO understands RMS's concerns in relation to mine commuter road safety and recognised these issues from the initial mine planning phase of the Project. • KEPCO has made a number of commitments to manage the mine commuter road safety and fatigue management issues which continue to remain valid. • KEPCO has provided further detail around these previous commitments to demonstrate that they are able to be implemented as measureable, reportable and enforceable management measures.
3.	Additional Information and Meeting	**Appendix C**	• KEPCO met with a representative from RMS Land Use unit on 23 June 2016 in Mudgee, with the outcomes of the meeting incorporated into the response. • KEPCO is willing to meet with the RMS's Land Use and Road User Safety units to further discuss the management of road safety and fatigue management issues as required and take the agreed outcomes into the Traffic Management Plan.
Mid-Western Regional Council			
1.	Temporary Workers Accommodation Facility	**Appendix D**	• KEPCO remains concerned about the potential risk and uncertainty for accommodating its construction employees within the Local Area. • This uncertainty is supported by the investigations into accommodation availability within the Local Area and the forecast Project demands (as presented in Appendix E of the RTS). It is also supported by the overlying assumption that the Wollar Road will be upgraded for use by Project-related employees which would be required should the WAF not be approved (i.e. to allow the township of Mudgee to be located a one-hour commute from the Project).

Issue Ref	Issue	Appendix	Response Summary
			• The WAF also provides an appropriate mechanism for reducing potential road safety risks during the construction phase of the Project. • The proposed WAF for the Project is development permissible with consent and is compliant with the relevant objectives and requirements for Temporary Workers' Accommodation set out in MWRCs statutory documents including the Mid-Western Regional LEP and associated Development Control Plan (DCP). • MWRC's submissions which do not support the WAF have not identified any inconsistencies of the WAF with the Mid-Western Regional LEP or DCP. • MWRCs submissions simply state (based on historical evidence) that the MWRC LGA has previously accommodated construction employees from other mines within the region. This is based on anecdotal evidence and KEPCO has yet to be provided with a contemporary survey based on factual data that can support MWRCs submissions. • KEPCO has provided a proposed draft Development Consent condition for DP&Es consideration along with the analysis provided for the WAF against MWRCs regulatory documents. • The proposed draft Development Consent condition facilitates a conditional approval for a WAF and requires KEPCO to demonstrate the need for this facility at the time is essential to provide certainty that the construction phase employees are able to be accommodated within the Local Area.
2.	Road Maintenance & Upgrades	**Appendix D**	• KEPCO has met with MWRC regarding the required road maintenance contributions for the Project.

Issue Ref	Issue	Appendix	Response Summary
			• KEPCO's offers for road maintenance contributions to date have been based on the anticipated road maintenance costs proportionate to the Project's use of the regional road network within the MWRC LGA. • KEPCO has also determined that any road maintenance contributions that are to be allocated by KEPCO to MWRC should take into account the value of the Voluntary Planning Agreement particularly in regard to any road capital programs. • KEPCO will seek to finalise a relevant road maintenance agreement with MWRC in this regard.
Wollar Progress Association			
1.	Emissions Due to Rail Activities	**Appendix E**	• Based on discussions with ARTC, there is sufficient surplus capacity on the Sandy Hollow to Gulgong Railway Line to minimise interruptions due to trains entering and departing the Bylong Rail Loop. • Therefore, the Project is not expected to result in any material increase in idling times of trains on the Wollar passing loop and accordingly no additional air quality impacts are anticipated.
2.	Network Capacity and Idling Trains	**Appendix E**	• As per item 1, ARTC has confirmed that there is sufficient network capacity to accommodate the train movements associated with the Project and therefore, it is not expected to increase the idling times on the Wollar Passing Loop. • The Traffic and Transport Impact Assessment assumed tunnel ventilation times consistent with previous studies and current ARTC operating protocols.

Issue Ref	Issue	Appendix	Response Summary
			• Impacts to level crossings and on rail noise from the Project are only expected to occur to the east of the Project. Accordingly, no such impacts are anticipated to occur within the vicinity of the Wollar Village as a result of the Project.
3.	Road Safety	**Appendix E**	• In light of various submissions received on the RTS, KEPCO commissioned a Road Safety Audit of the current condition of the regional road network, namely on Wollar Road and Bylong Valley Way (refer also to Item 1, RMS). • KEPCO is in discussions with the relevant roads authorities in relation to road maintenance agreements for the Project. The roads authorities may decide to utilise road maintenance funding to assist with the remediation of these existing road safety risks.
4.	Wollar Village Amenity	**Appendix E**	• The Noise and Blasting Impact Assessment from the EIS and Bylong Noise Report Addendum from the RTS provided the relevant noise assessment for Project-related traffic travelling on Wollar Road. • Assessment has confirmed that the increase in noise levels and cumulative noise levels resulting from the Project-related traffic are predicted to remain below the criteria prescribed within the Road Noise Policy.
5.	Oversized Loads	**Appendix E**	• All oversized and overmass vehicles related to the Project will travel via Wollar Road (Wollar to Mudgee Road) from Ulan Road. • This route has been identified as the most suitable route for the Project-related oversized and overmass vehicles given that it is a designated B-Double route. • Oversized or overmass vehicles for the Project will not use the Ulan-Wollar Road which has various unsealed sections and also travels through the more populated areas of Wollar Village.

Issue Ref	Issue	Appendix	Response Summary
			• The revised Traffic and Transport Impact Assessment (TTIA) indicated that both the road network and the associated intersections within and surrounding Wollar Village have ample capacity to accommodate the increased road traffic generated by the Project. • The predicted traffic movements for the Project during the peak construction phase period are predicted to remain well within the environmental capacity performance standards as detailed within the *RMS Guide to Traffic Generating Developments* (October 2002).
6.	Social Impacts	**Appendix E**	• KEPCO acknowledges that land purchases within the region by mining companies would have occurred prior to 2006. • The Social Impact Assessment (SIA) for the Project has stated that the significant population decline post 2006 in Wollar Village is due to the cumulative impacts of mining. • The SIA also acknowledges that there is little potential for any significant population growth in Wollar Village into the future.
Department of Industry – Division of Resources and Energy			
1.	The Division is satisfied that the Proponent has addressed all of the comments made.	**N/A**	• Noted.
Muswellbrook Shire Council			
1.	General Traffic Impacts and Assumptions	**Appendix F**	• The TTIA from the EIS modelled a proportion of Project-related traffic to and from the east of the Project via Bylong Valley Way, including both heavy and light vehicles.

Issue Ref	Issue	Appendix	Response Summary
			• Oversize or overmass vehicles for the Project will need to travel to the Project via Wollar Road due to the overhead rail bridge on Bylong Valley Way (to the east) and the general steep terrain and tight horizontal curves on the Bylong Valley Way to the east and south of the Project. • The worst case assessment within the TTIA did not identify any substantial implications to the capacity of the regional road network, including Bylong Valley Way or on intersection performance.
2.	Project's Impacts on Bylong Valley Way	**Appendix F**	• KEPCO has defined the Local Area as the locations within a one hour's drive from the Project site, as this is considered to be the likely and safe commute time for Project employees. • During the mine planning stage of the Project, the availability of workers and suitable accommodation was investigated within the Local Area. • Accommodation availability and workers at Denman and Sandy Hollow within the MSC LGA were minimal at the time and were heavily influenced by the mining industry. • Based on this accommodation availability and available workers, the TTIA within the EIS assumed a reasonable worst case 5% of the construction and operational employees would travel via Bylong Valley Way to the east. • In light of the downturn experienced within the mining industry in recent time, the revised TTIA assessed a modified distribution of operational employees (i.e. 6-7% of employees to travel to and from the Project from the east via Bylong Valley Way). • Based on these distributions, traffic modelling confirmed that the intersection and road mid-block capacities will continue to perform well within capacity with the introduction of Project-related traffic.

Issue Ref	Issue	Appendix	Response Summary
3.	Traffic Assessment on Bylong Valley Way to the East of Project Baseline Traffic Data	**Appendix F**	• The revised TTIA included an assessment of the Project's impacts on the regional road network, including roads and associated intersections more than 60 km away from the Project site. • The revised TTIA confirmed that the road mid-block capacity and intersection capacity on Bylong Valley Way will continue to operate with a good level of service with adequate spare capacity.
4.	Workforce assumptions	**Appendix F**	• KEPCO continues to foresee and supports its analysis that the majority of the workforce will reside within the MWRC LGA within the townships such as Mudgee, Rylstone and Kandos. • Whilst some of the workforce may reside within Denman and Sandy Hollow, this is likely to be a small proportion of the overall workforce. • The revised TTIA has assessed a modified workforce distribution in light of the mining industry downturn which has been experienced.
5.	Equipment Supply and workforce assumptions	**Appendix F**	• Whilst Denman and Sandy Hollow are closer than Mudgee, KEPCO considers that Mudgee is likely to accommodate a substantial portion of the Project workforce. • Denman and Sandy Hollow may provide a suitable place of residence for some of the Project workforce which will result in additional light vehicles utilising Bylong Valley Way to the east. • The TTIA and revised TTIA did assess a proportion of the workforce to travel to and from the Project site via the Bylong Valley Way to the east. • Should these proportions of Project-related traffic increase beyond that assessed, it is anticipated that the road network will still operate with good levels of service and that spare capacity will be available on the local road network.

Issue Ref	Issue	Appendix	Response Summary
			• The mining support services and equipment providers located within the Hunter Valley are generally located within the townships outside of the Local Area. Whilst it is acknowledged that some mining support services and equipment providers will be utilised from the Hunter Valley for the Project, it should be noted that the majority of specialist support services required by mining operations are available from within the MWRC LGA. • KEPCO will also encourage the mining support services and equipment providers which are located beyond the Local Area to establish a base within the Local Area. • The revised TTIA has assessed 10% of these services to be provided from the Hunter Valley.
6.	Impact of Heavy Vehicles on Bylong Valley Way	**Appendix F**	• In light of the identified road constraints on the Bylong Valley Way, KEPCO confirms that the majority of heavy vehicles (particularly those longer heavy vehicles that would be restricted by the narrow road widths, steep winding road sections and the rail overpass to the east of the Project) will utilise Golden Highway, Ulan Road and Wollar Road to access the Project. • KEPCO and its future EPC contractor will require the drivers of oversize or overmass heavy vehicles travelling from the east to utilise the Golden Highway route to minimise the potential safety risks to other road users on the Bylong Valley Way. • KEPCO will require Journey Management Plans to be prepared by the drivers of oversize or overmass heavy vehicles to ensure compliance with this commitment.
7.	Road use restrictions and traffic impact mitigations	**Appendix F**	• KEPCO has been advised by DP&E that a Voluntary Planning Agreement (VPA) should be discussed and negotiated with the MWRC over the Project.

Issue Ref	Issue	Appendix	Response Summary
			• The anticipated impacts on the 40 km section of Bylong Valley Way within the MSC LGA have been assessed to be low or insignificant. • KEPCO does not consider a VPA with MSC is required. • KEPCO is committed to the following items in relation to contributions to MSC which were discussed during the meeting on 26 May 2016: o Road dilapidation inspections prior to and following construction to confirm any impacts resulting from heavy vehicle usage. Based on the results of these inspections, KEPCO make a 'payment for damage' contribution to MSC for any identified Project-related damage caused by the construction activities that goes beyond normal wear and tear; o Make a financial contribution to assist MSC in the remediation of the road delineation and road signage issues (as recently identified within the Road Safety Audit) on its 40 km section of Bylong Valley Way prior to construction phase 1. This proposed financial contribution will be proportionate to the predicted increase in traffic movements on this section of Bylong Valley Way as a consequence of the Project; and o Conduct road traffic flow counts and monitoring of residential location of employees at various stages throughout the life of the Project (i.e. PYs 2, 9 and 13) to validate the assumptions made within the revised TTIA in relation to distribution of Project-related traffic across the road network.
8.	Suggested Development Consent Condition 1	**Appendix F**	• KEPCO commissioned and completed a Road Safety Audit on the regional road network (Bylong Valley Way and Wollar Road). • KEPCO proposes to make a financial contribution to assist MSC in the remediation of the road delineation and road signage issues on its 40 km section of Bylong Valley Way prior to construction phase 1.

Issue Ref	Issue	Appendix	Response Summary
			This proposed financial contribution will be proportionate to the predicted increase in traffic movements on this section of Bylong Valley Way as a consequence of the Project. • KEPCO also proposes to undertake dilapidation inspections of the 40 km section of Bylong Valley Way in consultation with MSC before and after Project-related construction activities. Based on the results of these 'before' and 'after' dilapidation inspections, KEPCO would make a 'payment for damage' contribution to MSC for any damage identified to the road beyond normal wear and tear which is the direct result of Project-related road traffic movements. • The anticipated negligible increase in traffic volumes on the Bylong Valley Way as a result of the Project will not materially change the deficiencies identified within the Road Safety Audit on the existing road network. • Notwithstanding this, KEPCO is committed to making a contribution to assist MSC with the remediation of the road delineation and road signage issues, prior to construction phase 1, which have been identified within the recently completed Road Safety Audit. These contributions will be proportionate to the identified increase in traffic movements as a consequence of the Project. • This funding will be provided on the basis that the remaining costs for the remediation of the identified road safety risks on the Bylong Valley Way within the MSC LGA, including road alignment and roadside hazards would be the responsibility of MSC.
9.	Suggested Development Consent Condition 2	**Appendix F**	• KEPCO accepts the request to complete a traffic survey (mid-block counts) prior to the commencement of construction activities at the location specified by the MSC in its submission.

Issue Ref	Issue	Appendix	Response Summary
			• The proposed traffic surveys will be conducted over two non-consecutive seven day periods prior to the commencement of construction. • The traffic flow data gained during these surveys will be utilised in comparison with previous traffic flow data on the Bylong Valley Way held by MSC to determine the existing traffic numbers and the component of heavy and light vehicles within the traffic flows recorded.
10.	Suggested Development Consent Condition 3	**Appendix F**	• KEPCO supports this recommendation and will update its management and mitigation commitments to include "*Project traffic with vehicles over 19 m long and 3 m wide shall be required not to utilise Bylong Valley Way from the east (i.e. Sandy Hollow) given the narrow and tight horizontal curves of sections of this road.*" KEPCO will require the drivers of vehicles over this size range to travel via the Golden Highway, Ulan Road and Wollar Road. • In an emergency situation, KEPCO will notify the relevant road authority (i.e. MSC and MWRC) when vehicles over this size range will utilise Bylong Valley Way to the east. This commitment will be outlined within the Construction Traffic Management Plan to be prepared for the Project.

Issue Ref	Issue	Appendix	Response Summary
11.	Suggested Development Consent Condition 4	**Appendix F**	• KEPCO does not seek to enter into a VPA with the MSC for the purposes of road maintenance contributions. • It was acknowledged in a meeting with MSC on the 26 May 2016 that the anticipated minimal usage of Bylong Valley Way by Project-related traffic does not warrant the need for annual road maintenance contributions. However MSC has identified other areas within which contributions are sought. • Item 7 above identifies KEPCO's commitments for inclusion in any Development Consent which may be granted over the Project.
Environment Protection Authority			
1.	Air Quality – Estimation of Diesel PM and Assessment of Impacts	**Appendix G**	• Supplementary $PM_{2.5}$ modelling was undertaken by Pacific Environment Limited (PEL) to address EPA's comments. • It is noted that this supplementary analysis undertaken to satisfy EPAs comments is beyond that required under the Approved Methods and other Government guidelines. • Results indicate there are no sensitive receptors predicted to exceed the $PM_{2.5}$ 24-hour average or annual average criteria as a result of the Project. • A Monte Carlo assessment included the contribution of diesel for predicted 24-hour average $PM_{2.5}$ concentrations. This assessment showed no additional days where the criterion is predicted to be exceeded compared to that shown in the AQGHGIA (Appendix O of the EIS).
2.	Air Quality – Approaches to Minimising Diesel PM Emissions	**Appendix G**	• EPA is seeking KEPCO to justify why further controls should not be applied on aspects which have been assessed to result in impacts less than the relevant criteria.

Issue Ref	Issue	Appendix	Response Summary
			• As previously committed, KEPCO will utilise standard mining-related equipment which will be maintained and operated in a proper and efficient manner to ensure the Project does not result in unacceptable diesel emissions.
3.	Low Frequency Noise	**Appendix G**	• Current international research and noise assessment guidance recommends that low frequency noise impacts should be assessed with consideration of audibility and potential annoyance depending on the frequency and noise levels experienced at the receiver. • This approach is applied in European noise criteria and has been adopted in recent guidance in Australia. Accordingly, the UK DEFRA approach to assessing low frequency noise has been applied to the Project with consideration to internal transmission loss. • The predicted impacts did not exceed the criteria with the exception of receivers already identified to receive significant noise impacts from the Project.
4.	Surface Water – Site Water Balance	**Appendix G**	• Water balance modelling indicates that under the modelling assumptions and configuration for the Project, there are no uncontrolled spills from the mine water management system. • KEPCO will consult with EPA during the mine closure planning phase of the Project to determine the licencing requirements for the pumping of surplus mine water to the underground mine workings at the completion of proposed mining operations.
5.	Surface Water – Sediment Basins	**Appendix G**	• KEPCO will seek the relevant EPL for the Project under the POEO Act which will incorporate the discharge locations from the sediment basins as required.

Issue Ref	Issue	Appendix	Response Summary
6.	Surface Water – Clean Water Diversions	**Appendix G**	• As explained within the RTS, Figure 30 of the EIS illustrates the clean water drain around the rail loop and CHPP area. This is to ensure that upstream undisturbed catchments can be diverted around the proposed Project.
7.	Waste Water	**Appendix G**	• During the detailed design phase, KEPCO will give further consideration to offsite disposal of waste water and will continue to consult with EPA.
Heritage Council of NSW			
1.	Protection of Heritage Values	**Appendix H**	• KEPCO has committed to ongoing consultation with the MWRC in relation to the items assessed of local significance under the Historic Heritage Impact Assessment. • KEPCO is continuing its investigation into the feasibility of potentially relocating several buildings located within the proposed footprint of the open cut mining areas that have been assessed of local significance. • The buildings have been the subject of structural engineering and survey advice to establish their structural integrity. • MWRC and key stakeholders will be engaged following receipt of structural and survey advice.
2.	Conservation Management Plans	**Appendix H**	• A Historic Heritage Management Plan (HHMP) will be prepared to guide the management of all potentially impacted heritage items not subject to demolition. • KEPCO will develop Conservation Management Plans for larger, more complex heritage items on KEPCO land which meet multiple significance criteria where greater management detail is required.

Issue Ref	Issue	Appendix	Response Summary
3.	Interpretation Plan	**Appendix H**	• As a component of its ongoing engagement with MWRC, KEPCO will consult with MWRC during the preparation of the Interpretation Plan.
4.	Historical Archaeological Sites and Impacts – Renfrew Park Remains 1 and 2	**Appendix H**	• An historical archaeological assessment will be undertaken for Renfrew Park Remains 1 and 2. If locally significant relics are present, these items will be subject to the relevant level of archaeological excavation and recording, prior to any impact occurring.
5.	Historical Archaeological Sites and Impacts – Archaeological Excavation	**Appendix H**	• Noted. For matters that would require Archival Recording and excavation of historical archaeological material that requires the involvement of an Excavation Director, KEPCO will comply with applicable statutory requirements.
6.	Historical Archaeological Sites and Impacts – Our Lady of the Sacred Heart Catholic Church	**Appendix H**	• The direct descendants of the known burials have indicated their preferences for where their ancestors are to be reinterred.
Timnath Pty Limited			
1.	Project Impacts on “Budden”	**Appendix I**	• As noted in Section 5.9.5 of the RTS, the predicted impacts to groundwater from the Project do not extend to the Budden Property for all scenarios modelled, including extreme condition scenarios. • The presence of the Growee Range between the Project and the Budden property has a significant influence on the impacts predicted by the numerical groundwater model for the Project. • Historical weathering of the coal seam in the vicinity of the alignments of the Bylong River, Lee Creek and the Growee River has removed sections of the primary coal seams proposed for mining.

Issue Ref	Issue	Appendix	Response Summary
			• This indicates that there is no direct connectivity for water to travel through the coal seam between the proposed mining areas and the properties west of the Growee Range (including the Budden Property). • The drawdown within the Permian and Triassic units therefore did not extend to these areas to the west. • With the implementation of a monitoring program and associated trigger levels within the Water Management Plan (WMP) for the Project, KEPCO would therefore be able to appropriately respond to any unforeseen impacts before the bores located on the Budden Property are adversely affected by the Project.
2.	Water Contamination and Compensation	**Appendix I**	• As noted in issue 1, the groundwater modelling undertaken for the Project has indicated that the bores on the Budden Property will not be affected. • The WMP will detail the monitoring program to be implemented to identify the impacts of the Project on the regional groundwater regime. The WMP will outline trigger levels to which the monitoring data will be analysed against. If these trigger levels are exceeded, further investigations will take place to confirm the reasons for the exceedance and identify any response required. • The trigger levels will be established to ensure that monitoring will identify any unforeseen drawdown impacts to the alluvial aquifer as a result of the Project, before any neighbouring landholder bore is adversely impacted.

Issue Ref	Issue	Appendix	Response Summary
			• Should monitoring indicate that the Project has resulted in changes to groundwater levels and quality, more extensively than predicted at any privately owned bore, then mitigation measures will be discussed within the landholder. This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be the result of the Project. • It is noted that it is highly unlikely that any such impact will be experienced at the Budden Property as a consequence of the Project.
3.	Compensatory Groundwater	**Appendix I**	• As per the response in issue 2, the WMP will outline the monitoring program and associated process to identify unforeseen impacts on the groundwater regime before neighbouring landholder bores are adversely affected.
4.	Compensation of Environmental Damage	**Appendix I**	• KEPCO will assist to remediate any environmental damage which has been caused directly by the Project through the loss of water from neighbouring privately owned landholdings.
5.	Compensation for Economic and Non-Economic losses	**Appendix I**	• Should monitoring indicate the Project has resulted in changes in groundwater levels and quality more extensive than predicted at any privately owned bore, then KEPCO will discuss potential mitigation measures with the landholder. • This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project.

Issue Ref	Issue	Appendix	Response Summary
6.	Proponents compliance with the above and guarantee into the future	**Appendix I**	• As explained in issues above, KEPCO will discuss mitigation measures (which may include make good provisions) if monitoring indicates that the Project has resulted to changes in groundwater levels and quality more extensive than predicted at any privately owned bore. • KEPCO has made a specific commitment regarding this, however would accept a Development Consent condition along these lines.
7.	Where will the compensatory water be sourced from	**Appendix I**	• The WMP will include further information in relation to the establishment of make good agreements between KEPCO and the landholders whose bores are considered to potentially be impacted by the Project, or are not predicted to be impacted but remain within relatively close proximity to the Project. • KEPCO will include within any make good agreement, the appropriate timing requirements for short and medium term resolutions to supplementing any water impacts. • Section 7.2.1 of Appendix H of the RTS provides examples of how an appropriate compensatory water supply could be provided as well as other financial compensations. These items will be considered within any make good agreement. • KEPCO's landholdings front a considerable proportion of the Bylong River, Lee Creek and Growee River alluvial aquifers. Therefore, there is the opportunity to construct additional bores (subject to relevant water licences) to provide further access to groundwater.

Issue Ref	Issue	Appendix	Response Summary
8.	Uncertainty in groundwater modelling	**Appendix I**	• Sensitivity and uncertainty analyses have been completed for the groundwater modelling in order to identify the sensitivity of assumptions utilised within the modelling and to assess uncertainty scenarios using reasonable worst case assumptions (such as assessing no recharge to the alluvial aquifer). • Therefore, there is certainty that real world outcomes will fall within the values identified for the extreme cases within the model. These modelling predictions have determined that the Project will not adversely impact upon the water supply to the Budden Property.
9.	Security for landholders in relation to Make Good Agreements	**Appendix I**	• KEPCO would accept a Development Consent condition for the implementation of make good agreements to compensate any unforeseen adverse impacts to neighbouring landholder bores determined to be as a result of the Project.
10.	Electronic loggers and monitoring on Budden property	**Appendix I**	• KEPCO's proposed extension to the monitoring network was as a direct result of feedback received from property owners/managers during meetings held in late 2015, including the property manager of Budden Property. • KEPCO accepts Timnath Pty Ltd no longer requires monitoring to be undertaken on the Budden Property.
11.	Address Timnath Pty Ltd's concerns and enter into agreement	**Appendix I**	• Noted. • KEPCO does not consider it appropriate to enter into "make good agreements" prior to the determination of Development Consent for the Project. • KEPCO are scheduled to meet with Timnath Pty Ltd on the 22 August 2016 to provide clarity over the extensive modelling work undertaken for the Project and to explain why no impacts are predicted to any water source on the Budden Property.

Issue Ref	Issue	Appendix	Response Summary
Department of Primary Industries – Water			
1.	Issue A – Water Security	**Appendix J**	• KEPCO and its groundwater consultants have undertaken an extensive work program over the last few years to provide improved certainty in relation to the groundwater modelling predictions, including reliability of the alluvial borefield. The RTS groundwater modelling built on the modelling undertaken within the EIS and made a number of refinements to the modelling based on stakeholder comments and additional groundwater monitoring data. • The RTS groundwater modelling also investigated the ability of the proposed borefield to generate the required makeup water for the Project during periods of extreme drought conditions. This analysis focussed on an extreme drought condition scenario and tested a wide range in hydraulic parameters within the modelling utilising a linear uncertainty analysis. • This uncertainty modelling demonstrated that under the extreme dry climatic condition scenario and utilising conservative hydraulic parameters, there were numerous occasions where the alluvial borefield would be able to sustain the makeup water demands for the Project. However, there remained the potential under extreme uncertainty scenarios where the proposed alluvial borefield may not be able to sustain the makeup water demands for the Project. KEPCO has committed to implement various initiatives in these instances. • It should be noted that all predictive model scenarios assessed for the RTS simulated the continued landholder pumping according to 100% water access licence volumes. Therefore, drawdown experienced at landholder bores has the consideration of cumulative drawdown included within all predictions.

Issue Ref	Issue	Appendix	Response Summary
			• It is noted that the optimised borefield layout within the RTS was developed based on the extreme dry climatic conditions and comprised 16 bores within the alluvium on KEPCO land. The extent of this borefield to the north was the main reason for the identified drawdown impacts to neighbouring privately owned bores within the alluvium in the RTS. • KEPCO has now finalised the additional work on the alluvial borefield (i.e. pump testing work on alluvial aquifer) to further validate and refine the hydraulic parameters being utilised within the groundwater model. This work is described within Section 4 of the Response to Submissions on Groundwater report prepared by AGE. The pump testing work identified that the permeability of the alluvial aquifer was higher than that previously measured by conducting rising and falling head tests within the monitoring bores installed within the alluvial aquifer. This additional monitoring information has been utilised within the latest round of groundwater modelling and has enabled a further refinement to the proposed borefield down to eight bores. • KEPCO and its consultants have investigated the likely magnitude of these concerns and identified the potential range in environmental impacts associated with the Project. Therefore, the groundwater model is considered a contemporary and useful tool for informing decisions about water management.

Issue Ref	Issue	Appendix	Response Summary
2.	Issue B – Drawdown Impacts on Nearest Users	**Appendix J**	• As noted within issue 1, KEPCO has completed the test pumping program to evaluate the yield of bores within the alluvial aquifer and its hydraulic properties to reduce the uncertainty associated with groundwater modelling predictions. Analysis of the test results indicated the alluvial groundwater system is more permeable than assumed in previous modelling and the groundwater model was updated to reflect this. The proposed borefield to supply the required makeup water to the Project was further refined. The borefield incorporates three of the four existing trial bores and five new bore sites within the alluvial aquifer system. • The location of the optimised bores proposed as part of the makeup water supply borefield are provided (Figure 6-11, **Appendix J**). • KEPCO has acquired the Tinka Tong property in June 2016 and have informed the relevant NSW Government Departments of this acquisition. Updated modelling (including uncertainty modelling) has indicated the risk of impact to the bores located on the Eagle Hill property (the closest privately owned bores to the Project) is low with no modelling scenarios predicting a drawdown of more than one metre at these bores.
3.	Issue C – Potential Salinity Impacts	**Appendix J**	• KEPCO will perform ongoing investigations to ensure the 150 m setback from the open cut mining areas to the alluvial boundary is not breached. • The WMP for the Project will provide a decision tree for management of groundwater quality. The decision tree will identify appropriate actions should groundwater quality decline and there is potential for a plume of brackish water to move from the open cut mining area into the surrounding environment.

Issue Ref	Issue	Appendix	Response Summary
			• Where appropriate, the decision tree will specify methods to quantify the movement of solutes in groundwater including contaminant transport modelling.
4.	Issue D – Borefield Water Supply Reliability	**Appendix J**	• Refer to item 7.
5.	Issue E – Bore Logs and Contour Maps	**Appendix J**	• Further detail in relation to the site geological conditions and items relating to aquifer conceptualisation was provided within the RTS. • Higher resolutions files of the borelogs and other requested information was provided to DPI-Water on 18 April 2016. • DPI-Water were also provided a copy of the Leap Frog Hydro model on 22 July 2016 which was developed to graphically illustrate (in 3D) the various layers from the numerical flow model for the Project. • It is agreed that the available data does indicate in some areas where there is a direct or indirect hydraulic connection between the alluvium and the coal seams proposed to be mined. • The areas where the coal seam subcrops directly beneath the alluvium, or is separated by a thin layer of weathered Permian sediments will be areas where the connectivity is enhanced. The MODFLOW USG model has appropriately represented this hydraulic connection between the Coggan Coal seam and the alluvium in these distinct areas. • KEPCO is committed to facilitating ongoing discussions with DPI-Water throughout the development of the post approval WMP. It is understood that DPI-Water now has the information required to facilitate this workshop.
6.	Issue F – Water Sharing Plan	**Appendix J**	• Noted.

Issue Ref	Issue	Appendix	Response Summary
7.	Issue G – Sensitivity Analysis	**Appendix J**	• As noted in item 1, KEPCO has completed the installation and testing of trial pumping bores at four sites within the alluvial aquifer. This work has indicated a more permeable and productive aquifer system occurs within the alluvials than previously represented within numerical models. • The Project's numerical model has been updated to reflect this new information and the remodelling has confirmed that the proposed borefield within the alluvium will not completely drain the aquifer. • The coal seams within the groundwater model were represented as being moderately permeable where they occur close to the surface and becoming less permeable with depth due to increasing stress and mineralisation filling cleats. The assigned values are considered appropriate for the purposes of regional groundwater modelling. • It is recognised that there is a direct or indirect hydraulic connection between some parts of the alluvium and the coal seams proposed to be mined and this has been appropriately represented within MODFLOW USG model. However, the impacts resulting from the depressurisation of the coal seams below the alluvial aquifers do not extend as far as the areas where there is a direct connection between the alluvium and coal seams. This is a result of several factors, including: o The alluvial aquifers ability to recharge the Permian groundwater system; o The hydraulic properties of the coal seams; and o The presence of a hydraulic buffer between the mining areas.

Issue Ref	Issue	Appendix	Response Summary
			• The alluvium acts as a recharge zone for localised Permian groundwater. Mine dewatering reduces the pressures below the alluvium; however, induced flow loss must be greater than surface water recharge, lateral through-flow, and storage to invoke significant drawdown to the alluvium. The groundwater model simulates this delicate balance for the base case, sensitivity runs, and uncertainty analysis simulations. • Results demonstrate that coal seam depressurisation does not invoke significant alluvial aquifer drawdown. In fact, a significant quantity of abstracted groundwater is required to drain the alluvial aquifer entirely, demonstrated by the sustainable yield of the proposed borefield. • The latest version of the numerical model was recalibrated to reduce the overly high groundwater levels in the alluvial and Permian groundwater units. This has slightly increased the number of dry cells along the alluvial-Permian interface, and has reduced the flow transfer rates between the Permian into the alluvium. • KEPCO, whilst it respects DPI-Water's suggestion, does not support the requirement to complete pumping tests for bores within the Ulan and Coggan coal seams. During the initial baseline monitoring period, KEPCO commissioned Douglas Partners to complete a significant program of packer testing within the Triassic and Permian bedrock units for the purposes of characterising the hydraulic conductivity of these units. This information has provided useful information to guide the development of the numerical model.

Issue Ref	Issue	Appendix	Response Summary
			• KEPCO's groundwater consultants have advised that pumping tests are not practically appropriate within any other units except the alluvium. This is because the yield from the bedrock units is typically too low to sustain pumping at any useful rate. In this case, the packer testing methodology has been utilised as a more appropriate technique for measuring hydraulic conductivity within the coal seams and other bedrock units.
8.	Issue H – Part 5 Water Licences	**Appendix J**	• Noted. • The latest version of the groundwater modelling has predicted a larger inflow to the mining areas than predicted within the EIS. • KEPCO proposes to hold further discussions with DPI-Water in relation to varying the water allocation sought within the *Water Act 1912* licence application to correspond with the revised groundwater inflow predictions.
9.	Issue I – Creek Remediation	**Appendix J**	• Noted.
10.	Issue J – Geological Cross Sections	**Appendix J**	• DPI-Water were provided a copy of the Leap Frog Hydro model on 22 July 2016 which was developed to graphically illustrate (in 3D) the various layers from the numerical flow model. • Utilising this Leap Frog Hydro model tool, DPI-Water is able to explore any additional cross sections from the numerical flow model that they would like to review in addition to the ones provided.
11.	Potential Spoils Contamination	**Appendix J**	• KEPCO will develop and implement a Mine Waste Management Plan to appropriately manage the waste materials generated throughout the mining process to minimise potential risk of impact to the neighbouring environment.

Issue Ref	Issue	Appendix	Response Summary
			• This Mine Waste Management Plan will be prepared consistent with the recommendations from the Geochemical Impact Assessment (Appendix AB of the EIS) and will include provisions for the monitoring of runoff and seepage from overburden, interburden and coal rejects on a regular basis during the operations phase of the Project. • The WMP for the Project will also include details on the monitoring program to be implemented to monitor potential contamination from the overburden emplacement areas.
12.	Mine Water Security	**Appendix J**	• KEPCO has installed an extensive network of groundwater monitoring bores to characterise the regional groundwater regime as part of the baseline monitoring period. A number of these bores will be suitable for long term monitoring of groundwater levels and quality during mining and beyond. However, it is recognised that some of these bores will be removed by open cut or underground mining and replacement monitoring bores will be required. • Additional monitoring bores are also proposed in the vicinity of the proposed pumping bores as part of the borefield in order to monitor the drawdown within the alluvial aquifer. • The WMP will identify where gaps within the existing or future monitoring network are present, and provide a staged plan for the installation of additional monitoring sites as required.
13.	Outstanding Recommendations – Weathered Zone Figure	**Appendix J**	• DPI-Water has been provided a copy of the Leap Frog Hydro model on 22 July 2016 which was developed to graphically illustrate (in 3D) the various layers from the numerical flow model. The weathered zone across the numerical model domain is able to be viewed utilising this tool.

Issue Ref	Issue	Appendix	Response Summary
			• During the early stages of the groundwater investigations for the Project, a network of monitoring bores was installed into the weathered zone. The bores were located to measure hydraulic properties and monitor groundwater levels adjacent to potential open cut mining areas, and to understand the potential for the weathered zone to indirectly connect the mining areas with the alluvial aquifer. • The Response to Submissions on Groundwater report included as Appendix H of the RTS included maps (Figure 18) indicating the thickness of the weathered zone and discussed the measured hydraulic properties. • Further information on the hydraulic properties and water levels fluctuations measured within the weathered zone has been provided. • The weathered zone has been conservatively represented within modelling as a permeable zone that will allow transmission of groundwater according to hydraulic gradients and permeability. • The installation of five additional monitoring bores along Dry Creek identified that the material adjacent to Dry Creek was dry.
14.	Outstanding Recommendations – Basalt Aquifer Contour Map	**Appendix J**	• A further investigation into the potential for the Tertiary basalt to form an aquifer system has been provided within the AGE Response to Submissions on Groundwater. • Geophysical logs collected during the coal exploration program indicated at five sites that the Tertiary basalt was dry with the water table occurring in underlying strata. • The conceptual hydrogeological model for the basalt is that it remains unsaturated although may support short-term perching as part of normal recharge mechanisms as rainfall drains to deeper units.

Issue Ref	Issue	Appendix	Response Summary
15.	Outstanding Recommendations – Individual Water Aquifer Water Balance	**Appendix J**	• Section 6 of AGE's Response to Submissions on Groundwater describes the latest round of numerical modelling and provides model water budgets and balance tables.
16.	Outstanding Recommendations – Future Monitoring Bores	**Appendix J**	• The WMP will determine where there are potential gaps in the monitoring bore network and will include consideration of all geological units overlying the proposed underground mining area including the Farmers Creek Formation, the Gap Sandstone, Watts Sandstone or other units. • The Water Management Plan will outline the methods to be utilised for monitoring evaporation at the Project site.
17.	DPI – Recommended Conditions of Approval	**Appendix J**	• Refer to **Appendix J**.
Department of Primary Industries – Agriculture			
1.	BSAL Impacts – Updated BSAL Mapping	**Appendix K**	• A number of Maps and tables are provided to clarify issues raised relating to BSAL impacts and future land use. • 63% of BSAL to be directly and permanently disturbed is considered to be Class 4 to Class 6 Land and Soil Capability and therefore would not be suitable for cultivation. • Noted that Class 4 Land and Soil Capability includes land that is generally used for grazing and pasture improvement. Classes 5 and 6 are generally suited to grazing only. • Several meetings have been held to resolve and clarify issues raised by DPI-Agriculture.
2.	BSAL Impacts – BSAL within Subsidence Study Area	**Appendix K**	• The EIS committed to reinstate 227 ha of BSAL within post mining rehabilitation which was based on the identification of 206.3 ha of BSAL within the direct and permanent disturbance footprint.

Issue Ref	Issue	Appendix	Response Summary
			• In response to DPI-Agriculture's submission, an additional 191 soil samples from 49 sites within the proposed disturbance footprint were tested and assessed against the BSAL criteria. • This additional testing resulted in the identification of an additional 113.2 ha of BSAL within the direct and permanent impact domain and a further 40.9 ha of BSAL within the direct and temporary impact domain. • KEPCO is committed to re-instating all BSAL to be 'directly and permanently' and 'directly and temporarily' impacted by the Project.
3.	BSAL Impacts – Repair of BSAL Impacts	**Appendix K**	• The proposed BSAL rehabilitation within the "direct and temporary" impact domain will utilise the same rigorous methodology as detailed in the EIS for BSAL rehabilitation in the "direct and permanent" impact domain.
4.	BSAL Impacts – BSAL Loss to Mining	**Appendix K**	• Additional maps and figures have been provided as included in the **Appendix K**.
5.	BSAL Impacts – Adjoining BSAL	**Appendix K**	• Drawing files provided to DPI–Agriculture on 15 June 2016.
6.	BSAL Impacts – Loss of Farming Land	**Appendix K**	• Areas of cleared and cultivated lands within the offset properties which are to be retained for agricultural use are located adjacent to existing farm tracks, access roads or public roads. • Access arrangements to these areas of BSAL will be maintained for the purpose of supporting the ongoing agricultural use of this KEPCO owned land.
7.	CIC Impacts – Equine CIC	**Appendix K**	• Whilst the Bylong Valley has historically been used for thoroughbred breeding and other horse enterprises, the available information provides that this industry experienced the vast majority of its decline within the Valley prior to KEPCO land purchases.

Issue Ref	Issue	Appendix	Response Summary
			• KEPCO purchased a single property in 2012 which was being utilised for thoroughbred horse breeding. The operations on this property were subsequently relocated to Denman, closer to the centre of the mapped Equine CIC. This property is not proposed to be directly disturbed by mining activities and remains available for agricultural pursuits, including thoroughbred horse breeding. • Part of the area within the Project Boundary has since been mapped by the NSW Government as Equine CIC, which indicates that at the time of mapping there was valuable horse related industries operating in the area. • Horse studs in NSW vary greatly in the biophysical features of the land upon which they are located. There are no set requirements for natural features, landforms or soil types, which dictate whether an area is suited to establishing an equine enterprise. However, typically the landscapes which provide better quality grazing have been traditionally chosen to develop equine businesses upon. • The aim of the rehabilitation within the Project Boundary is to establish a range of soil profiles and land capabilities, including the creation of BSAL, and LSC classes 3, 4, 5, 6 and 7. These target outcomes are congruent with the potential for the rehabilitated land to be used as an equine grazing business. • Therefore the use of the land for such an endeavour will not be limited by the physical landform, soil profile or pasture established on site.

Issue Ref	Issue	Appendix	Response Summary
8.	CIC Impacts – Losses of Equine CIC	**Appendix K**	• Given that the land within the Project Boundary is currently not utilised for equine related purposes and unlikely to in the future due to the significance of its ecological values, it is determined that there will be: o No impact on the viability of the Equine CIC as a whole; o No product or service provided to the Equine CIC to which the Equine CIC can value add to; and o No impact on the reputation or market ability of the industries of the Upper Hunter Equine CIC.
9.	Water Impacts	**Appendix K**	• KEPCO has purchased various landholdings within the Bylong River valley that have contained associated water licenses. KEPCO will operate within the constraints of its license entitlements and any annual reductions in allocations. • Water modelling for the Project has identified that only in the extreme and unlikely scenario that a period of extreme dry coincides with the highest project demand phase (Project Year 3) would a reduction in agricultural water on KEPCO owned properties be required. • The WMP will detail the process taken in extreme drought conditions to transfer water from agricultural activities to the Project.

Issue Ref	Issue	Appendix	Response Summary
			• KEPCO undertakes to make available for agricultural use any water shares it holds not required for operation of the Project (including a risk buffer). However, it is not reasonable for KEPCO to make a binding undertaking to keep a certain area under irrigated agriculture due to the time frame of the Project (25 years) and the potential for changes in agricultural economics and technology during this period.
10.	Biodiversity Offsets Impacts	**Appendix K**	• The ongoing agricultural use of BSAL areas within the Biodiversity Offset areas would conflict with the desired biodiversity outcomes for the Project's offset strategy. • However part of the process to reinstate Box Gum Woodland will initially involve grazing to control weeds within these areas. Over time, this grazing shall be progressively reduced as weed control becomes less of a management issue within these re-establishing landscapes. • Eventually grazing shall be removed from the offset lands in perpetuity. • The various offset areas for the Project which contain areas of BSAL also contain threatened ecological communities and other habitat suitable for various threatened flora and fauna species which are proposed to be regenerated.
11.	Biodiversity Offsets	**Appendix K**	• KEPCO supports DPI-Agriculture's desire to be involved in the establishment of trials on the rehabilitation as committed to within the EIS.

Issue Ref	Issue	Appendix	Response Summary
12.	Anthroposols	**Appendix K**	• Specific BSAL criteria as detailed in the Interim Protocol for Site Verification of BSAL (2013) will form the criteria for achieving BSAL post mining, and measurements will be taken over time to identify progress and highlight improvements that may be required. • Furthermore the criteria listed in the LSC Guideline (2012) will be used to create and evaluate the successful establishment of specific land and soil capability classes. • Other criteria such as those suggested by DPI-Agriculture in its submission, whilst not necessarily required for the identification of BSAL pre or post mining, may be used as a monitoring/management tool for assessing general rehabilitation progress. • However, these criteria will not be included in the closure criteria for verifying BSAL or LSC classes. • Further work will be undertaken in relation to the relevant inherent fertility measure in consultation with DPI-Agriculture and be included within the Rehabilitation Management Plan.
13.	Rehabilitation Trials – 1	**Appendix K**	• KEPCO will continue to liaise with DPI-Agriculture with regard to the rehabilitation trial designs and monitoring methods to ensure the rehabilitation objectives in relation to re-establishing the post mining agricultural land use is undertaking in a robust and meaningful manner.
14.	Rehabilitation Trials – 2	**Appendix K**	• Noted.

Issue Ref	Issue	Appendix	Response Summary
15.	Rehabilitation Trials – 3	**Appendix K**	• Landform Function Analysis (LFA) is proposed to be utilised as a tool to monitor land stability and function in the period prior to it being available for the intended post mining land use. • Once the LFA has demonstrated the stability of the landform, the use of the landform for intended post mining landuse will be implemented and monitored against the relevant criteria. • Specific closure criteria for the intended post mining landuse will be detailed within the Rehabilitation Management Plan for the Project.
16.	Trigger Action Response Plans	**Appendix K**	• The Rehabilitation Management Plan will be prepared following development consent approval in consultation with DPI–Agriculture, DP&E and approved by DRE prior to the commencement of construction of the Project.
17.	Soil Reinstatement Volume Calculations	**Appendix K**	• A revised soil balance has been prepared in light of the additional soil sampling undertaken in early 2016. • The revised soil balance demonstrates that there will be suitable soil resources available for the proposed rehabilitation for the Project.
18.	Losses of Scenic and Landscape Values	**Appendix K**	• Tinka Tong was acquired by KEPCO in June 2016 and is therefore no longer a private freehold property. • Visual management measures for all other private freehold and public viewing locations are consistent with the commitments within the EIS and RTS.
19.	Socio-Economic Aspects – Agricultural Support Services	**Appendix K**	• Further analysis of impacts of the Project on the Equine CIC has been undertaken.

Issue Ref	Issue	Appendix	Response Summary
			• It was demonstrated that the Project will not have a significant impact on the Hunter Equine industry, including the equine industry's value to the Upper Hunter, regional, State and National economies.
20.	Socio-Economic Aspects – Processing and Value Adding Industries	**Appendix K**	• As per item 19. • The value add of the potential outputs from the mapped Equine CIC within the Project area is well below the threshold recommended by NSW DPI (NSW DPI AIS technical notes, April 2013, Section 4.3 p9) as a significant threshold. • This demonstrates that the Project will not have a significant impact on the Hunter Equine CIC, including to the equine industry's value add to the Upper Hunter, regional, State and National economies.
21.	Socio-Economic Aspects – Agricultural Enterprises	**Appendix K**	• The soil profile will be suited to class 5 LSC and therefore potential grazing (light to moderate only) may be feasible.
22.	Socio-Economic Aspects – Agricultural Infrastructure – Increased Traffic on Bylong Valley Way	**Appendix K**	• The Project is located within the MWRC LGA and therefore a majority of the road works and other activities are proposed within this LGA. • KEPCO is aware that MSC is the appropriate roads authority for the 40 km section of Bylong Valley Way from the Kerrabee Range (approximately 16 km to the east of the Project Boundary) to the Golden Highway. • KEPCO is continuing discussions with the MSC in relation to providing a road maintenance contribution. It should be stressed that the contributions should be proportionate to the Project's demand on this small section of the regional road network to be utilised for the Project.

Issue Ref	Issue	Appendix	Response Summary
DP&E Groundwater Independent Peer Review			
1.	Comparison of results from different model codes	**Appendix L**	• It is also noted that the model results that AGE was comparing were not the same. They each have differing underlying model code, parameters, stresses and layering. This is the main reasons for the differences between the models. • Further, HydroSimulations investigated the differences between MODFLOW SURFACT (MS) and MODFLOW USG (USG) model codes. • HydroSimulations have concluded that the results from the two model codes are not always similar and the size and the direction of the discrepancy between model results has no pattern that can be reliably anticipated.
2.	Streamflow Routing Package	**Appendix L**	• AGE has included the streamflow routing package into the latest modelling as described within the AGE Response to Submissions on Groundwater report.
3.	Water Balance	**Appendix L**	• AGE has confirmed that the main reason for the increased river leakage within the RTS modelling was the result of large model cells around the Goulburn River. • The latest modelling for the Project has refined the model cells around the Goulburn River to remove this issue.
4.	Independent Audit	**Appendix L**	• As noted in Item 1, HydroSimulations has completed a Model Audit and verification of the AGE models and to resolve queries relating to the comparison in model codes. The Model Audit report is provided within **Appendix L**.
5.	Mitigation and Management	**Appendix L**	• Noted.

Issue Ref	Issue	Appendix	Response Summary
6.	Test Bores	**Appendix L**	• KEPCO has recently completed a test pumping program within the alluvial aquifer to further validate and refine the hydraulic parameters being utilised within the groundwater model. This work is described within Section 4 of the Response to Submissions on Groundwater report prepared by AGE.
7.	Pumping Rates Metering	**Appendix L**	• As per item 6.
8.	Observation Bores	**Appendix L**	• As per item 6. • The WMP will identify where gaps within the existing or future monitoring network are present, and provide a staged plan for the installation of additional monitoring sites as required.
Forestry			
1.	Access	**Appendix M**	• It is understood that access to the Bylong State Forest has been via farm tracks on the "Bylong Station" property which is owned by KEPCO. • KEPCO will work with Forestry Corporation of NSW and other relevant parties in the process of establishing an approved right of way to the Bylong State Forest. This could be via KEPCO owned land or via an alternate access. • KEPCO is committed to maintaining access to the Bylong State Forest via the "Bylong Station" property until the appropriate "right of way" easement is established.

Issue Ref	Issue	Appendix	Response Summary
2.	Compensable Losses	**Appendix M**	• KEPCO will undertake repairs through the current statutory process to any damage caused by subsidence to Forestry Corporation infrastructure as a result of the longwall mining operation below the Bylong State Forest. • KEPCO will prepare and implement a monitoring program in consultation with the Forestry Corporation to evaluate the impacts of subsidence on aspects that have the potential to affect future harvesting operations or forest productivity. • The repairs would be undertaken subject to a risk assessment on the safety to persons affecting such repairs. Subject to accessibility, some impacts may be unrepairable. • KEPCO will continue to liaise with FCNSW to agree on the appropriate methodology to be utilised to determine the quantifiable losses suffered by FCNSW in relation to any unrepairable damage to the productivity of the FCNSWs estate. • This damage will be determined through the monitoring programs developed in consultation with FCNSW as part of the Extraction Plan process.

Issue Ref	Issue	Appendix	Response Summary
3.	Ongoing Liability for Damage or Disruption due to Subsidence	**Appendix M**	• KEPCO will undertake repairs to erosion and subsidence cracking caused by subsidence due to its proposed longwall mining operations below the Bylong State Forest. Remediation of erosion and subsidence cracking will be undertaken subject to a risk assessment on the safety to persons affecting such repairs. • KEPCO will put in place suitable signage to advise members of the public of the potential for subsidence impacts and put in place the appropriate safety requirements in the area. • Remediation activities which are deemed unsafe for workers to undertake will be appropriately identified through an agreed active monitoring program and the potential liabilities will be assessed and presented to FCNSW. • KEPCO will ensure that the subsidence related impacts that are not able to be safely remediated will not result in any ongoing material safety, environmental or operational liabilities for FCNSW post-mining.

4 REVISED MANAGEMENT AND MONITORING SUMMARY

This section provides a summary of the additional management and monitoring commitments from this Supplementary RTS.

Following consideration of the submissions received from stakeholders, KEPCO has undertaken additional works as part of this Supplementary RTS to address the issues raised. **Table 2** provides a consolidated summary of the proposed Project amendments, additional environmental management and monitoring measures included in the Supplementary RTS and its source.

Table 2
Revised Project Management and Monitoring Measures

Ref	Commitment	Section
Project Amendments		
1.	Optimised location of the Project borefield within the alluvium, reduced from 16 to 8 bore locations (as illustrated on Figure 6-11, **Appendix J**). Acknowledged that the borefield can be augmented with additional bore sites within the alluvial aquifer if required.	**2.11**
Subsidence		
2.	KEPCO will continue to liaise with FCNSW to agree on the appropriate methodology to be utilised to determine the quantifiable losses suffered by FCNSW in relation to any unrepairable damage to the productivity of the FCNSWs estate.	**2.14**
3.	KEPCO will ensure that the subsidence related impacts that are not able to be safely remediated will not result in any ongoing material safety, environmental or operational liabilities for FCNSW post-mining.	**2.14**
Ecology		
4.	KEPCO will include provisions within the Biodiversity Management Plan (BMP) to undertake searches of potential roost sites at prominent cliffs within and adjacent to the Subsidence Study Area (C5, C6, C8 and C9) in conjunction with the monitoring of cave-dwelling microbats.	**2.2**
Biodiversity Offsets Strategy		
5.	KEPCO will continue to engage with OEH to ensure that the correct number and type of credits are retired for the Project.	**2.2**
6.	KEPCO will continue to liaise with OEH to ensure that there is agreement on the method utilised for mapping Regent Honeyeater habitat within the Project Disturbance Boundary and offset areas according to the latest OEH Threatened Species Profile Database.	**2.2**

Ref	Commitment	Section
Surface and Groundwater		
7.	KEPCO will seek the relevant EPL for the Project under the POEO Act which will incorporate discharge locations from sediment basins as required.	**2.8**
8.	KEPCO will consult with EPA during the mine closure planning phase to determine the licencing requirements for the pumping of surplus mine water to the underground mine workings.	**2.8**
9.	KEPCO will continue to liaise with DPI-Water in relation to varying the water allocation sought within the *Water Act 1912* licence application to correspond with the revised groundwater inflow predictions.	**2.11**
Aboriginal Heritage		
10.	KEPCO will undertake a specialist study (in the post-approval stage), taking into account all of the recommendations presented in the Gunn (2016) Report which will be outlined within the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP) to be prepared in consultation with the RAPs, including the Warrabinga Wiradjuri #4 Native Title Claimants.	**2.2**
11.	KEPCO will adhere to the recommendations from OEH to offset the cumulative impact to Aboriginal Heritage.	**2.2**
12.	KEPCO will undertake further work to assess and document cultural significance during the Heritage Management Plan process.	**2.2**
Rehabilitation and Final Landform		
13.	Further considerations or methodologies for measuring the fertility of reinstated BSAL soils will be undertaken in close consultation with DPI-Agriculture for inclusion within the Rehabilitation Management Plan.	**2.12**
Agriculture		
14.	KEPCO will make cleared or cultivated land areas, contained within the Project Biodiversity Offset Areas available for agriculture or other land uses during the life of the Project and beyond.	**2.12**
Traffic and Land Access		
15.	All oversized and overmass vehicles related to the Project will travel via Wollar Road (Wollar to Mudgee Road) from Ulan Road.	**2.5**
16.	KEPCO and its future EPC contractor will require the drivers of oversize or overmass heavy vehicles travelling from the east to utilise the Golden Highway route. Journey Management Plans to be prepared by drivers to ensure compliance with this commitment.	**2.7**

Ref	Commitment	Section
17.	KEPCO is committed to the following items in relation to contributions to MSC: • Road dilapidation inspections to be conducted prior to the commencement of construction activities and at the end of Project Year (PY) 2 of construction; • A 'payment for damage' contribution to MSC based on the results of the 'before' and 'after' dilapidation inspections and determination of the level attributed to Project traffic; • A financial contribution to MSC to assist in the remediation of the road delineation and road signage issues (as recently identified within the Road Safety Audit) on its 40 km section of Bylong Valley Way prior to construction phase 1; and • Monitoring and reporting on Project-related traffic distributions on the regional road network at key stages throughout the life of the Project to verify the assumptions utilised within the revised TTIA.	**2.7**
Geochemistry		
18.	A Mine Waste Management Plan will be prepared consistent with the recommendations from the Geochemical Impact Assessment (Appendix AB of the EIS).	**2.11**

5 CONCLUSION

This Supplementary RTS report has been prepared as a consolidated summary of the responses to the additional stakeholder submissions made to DP&E in response to the RTS.

The supplementary information presented within the Mine Plan Justification Report has confirmed that the recovery of coal from the two small open cut mining areas is critical for not only the financial viability for the Project but to provide an environmentally proven solution to both washery waste and site water management.

Discussions are continuing with MWRC to resolve issues surrounding the need for a WAF. KEPCO remains concerned about the potential risk and uncertainty for accommodating its construction employees within the Local Area. There is no statutory limitation for the construction of the WAF as it is in compliance with the requirements of the *Mid-Western Regional Local Environmental Plan 2012* or its supporting Development Control Plan.

KEPCO is imploring to DP&E to support KEPCO's position that a conditioned approval is necessary for a WAF to be constructed, if it is demonstrated at the time to be a necessary component of the Project.

KEPCO is continuing discussions with both MWRC and MSC to progress an agreement for road maintenance contributions, based on the anticipated road maintenance costs proportionate to the Project's use of the road network. KEPCO has also determined that any road maintenance contributions that are to be allocated by KEPCO to MWRC should take into consideration the Voluntary Planning Agreement already agreed over the Project, particularly in respect of any capital road improvement works programs.

Further modelling has been completed to reduce uncertainty surrounding the groundwater impacts as a result of the Project. The modelling confirms impacts remain acceptable for all private landholders in the vicinity of the Project.

This report has confirmed that the environmental impacts of the Project have been identified with certainty and will be acceptably managed by operational controls, negotiated agreements with landowners and management plans that will be established and approved as required by the Secretary of DP&E and other relevant Government agencies.

The Project will generate significant economic benefits to the local region, NSW and the wider Australian economy. KEPCO is confident that residual issues have been thoroughly addressed and DP&E can now finalise their report to enable the Project to proceed to the next stage in the planning approvals process for State Significant Developments in NSW.

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A

Mine Plan Justification Report

– Additional Supporting Information

BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

BYLONG COAL PROJECT

MINE PLAN JUSTIFICATION REPORT ADDITIONAL SUPPORTING INFORMATION

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for

WorleyParsons Services Pty Ltd

1 INTRODUCTION

1.1 BACKGROUND

KEPCO Bylong Australia Pty Limited (KEPCO) owns the Bylong Coal Project (the Project) which is located within the Mid-Western Regional Council (MWRC) Local Government Area (LGA) approximately 55 km to the north-east of Mudgee.

The Project involves the construction and operation of a coal mine utilising open cut and underground mining methods to recover up to approximately 6.5 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal for a period of approximately 25 years.

KEPCO submitted an Application for State Significant Development (SSD) Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 23 July 2015 to facilitate the development of the Project (SSD 14_6367). KEPCO also submitted a Referral to the Commonwealth Department of the Environment (DoE) for the Project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Project has been deemed a "controlled action".

The '*Bylong Coal Project Environmental Impact Statement*' (EIS) (Hansen Bailey, 2015) was prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and was placed on public exhibition between 23 September 2015 and 6 November 2015. The EIS provided an explanation of the various mine plan alternatives which had been considered during the mine planning process to determine KEPCO's preferred mine plan for the Project. The various mine plan alternatives are explained within Section 3.17 and Appendix E (Mine Plan Justification Report) of the EIS.

A total of 383 submissions were received by Department of Planning and the Environment (DP&E) during the public exhibition of the EIS. The '*Bylong Coal Project Response to Submissions*' (RTS) (Hansen Bailey, 2015) was prepared on behalf of KEPCO. The document responds to the issues raised in submissions by stakeholders during the public exhibition period.

The RTS included a Supplementary Mine Plan Justification Report to provide further context in relation to the financial and practical requirements for the Project to include the open cut mining operations.

Responses to residual stakeholder issues have recently been prepared for DP&E's consideration in its Preliminary Assessment Report for the Project. DP&E has highlighted the requirement for it to consider the various stakeholders concerns in relation to the environmental impacts generated by the open cut component of the Project and to justify why this component of the Project should be approved. DP&E has indicated that a good level of information is available from KEPCO and other stakeholders in relation to the economic benefits of the open cut component of the Project. However, DP&E has suggested that further details may be required to confirm the implications that would result from the assessment of the removal of this component from the Project.

1.2 DOCUMENT PURPOSE

This report has been prepared to provide DP&E with further context in relation to the implications of simply excluding the open cut mining component from the Project (the hypothetical scenario). It should be noted that the hypothetical scenario has been investigated for comparison purposes only and does not represent a properly engineered or planned alternative underground only option for the Project.

This report provides a comparison of the potential environmental impacts and risks between the Project and the hypothetical scenario. The report also provides a specific focus on the decisions that would be made for the inclusion of a series of Tailings Storage Facilities (TSFs) to receive waste material from the CHPP in the absence of the open cut mining areas for disposal of tailings. The report also discusses the various changes which would be required to the mine water management system for the hypothetical scenario. Beyond this, the report also identifies other key practical matters (such as land acquisition strategies and recovery of mineable coal resources) that would be materially different in the absence of the open cut component of the Project.

1.3 DOCUMENT STRUCTURE

Section 2 provides a description of the Project and the key components of the Hypothetical Underground Only Scenario which are relevant to this report. **Section** 3 provides a description of the key environmental impacts for the Project in comparison with the Hypothetical Scenario. **Section** 4 provides a discussion of the key benefits and impediments between the Project and the Hypothetical Scenario as outlined within this report. **Section 5** provides a conclusion for the report and identifies a way forward for DP&E's consideration during the preparation of its Secretary's Environmental Assessment Report.

2 DESCRIPTION OF SCENARIOS FOR COMPARISON

This section provides a description of the Project (as described within the EIS, RTS and other supporting documents) and a Hypothetical Scenario whereby open cut mining operations are specifically excluded from the Project.

2.1 PROJECT DESCRIPTION

As detailed within Section 3 of the EIS, the Project involves the construction and operation of a coal mine utilising both open cut and underground mining methods to recover approximately 124 Million tonnes (Mt) of ROM coal at a rate of up to approximately 6.5 Mtpa of ROM coal for a period of approximately 25 years. The key features of the Project (of relevance to this report) include:

- The initial development of two open cut mining areas with associated haul roads and Overburden Emplacement Areas (OEAs), utilising a mining fleet of excavators and trucks and supporting ancillary equipment;
- The two open cut mining areas will ultimately provide for the storage of coal processing reject materials from the longer term underground mining activities;
- Construction and operation of an underground coal mine;
- A combined maximum extraction rate of up to 6.5 Mtpa ROM coal;
- A workforce of up to approximately 665 during the initial construction phase and a peak of 470 full-time equivalent operations employees at full production;
- Underground mining operations utilising longwall mining techniques with primary access provided via drifts constructed adjacent to the rail loop and Coal Handling and Preparation Plant (CHPP);
- The construction and operation of facilities to support underground mining operations including personnel and materials access to the underground mining area, ventilation shafts, workshop, offices and employee amenities, fuel and gas management facilities;
- Construction and operation of a CHPP with a designed throughput of approximately 6 Mtpa of ROM coal, with capacity for peak fluctuations beyond this;
- The dewatering of fine reject materials through belt press filters (or other similar mechanical dewatering technology) within the CHPP and the co-disposal of dewatered fine and coarse reject materials within OEAs and final open cut voids (avoiding the need for a tailings dam);
- The construction and operation of surface and groundwater management and water reticulation infrastructure including diversion drains, dams (clean, dirty and raw water), borefield, pipelines, pumping stations and other required infrastructure; and
- Infilling of mining voids, progressive rehabilitation of disturbed areas, decommissioning of Project infrastructure and rehabilitation of the land progressively following mining operations.

Features of key relevance to this report are discussed in the following sections.

2.1.1 Management of Coal Processing Waste

As explained within Section 3.5.4 of the EIS, the CHPP is proposed to have belt press filters (or a similar mechanical dewatering system) installed which will enable the dewatering of fine

reject materials generated through the coal washing process. The fine reject materials are proposed to be combined with coarse reject materials and co-disposed with overburden within the proposed open cut mining areas. This methodology enables the open cut void remaining at the end of open cut mining to be filled with the coarse and fine reject materials which are generated by the longer term underground mining operations. Using this methodology will effectively achieve a landform containing no void within the landscape post mining.

2.1.2 Water Management

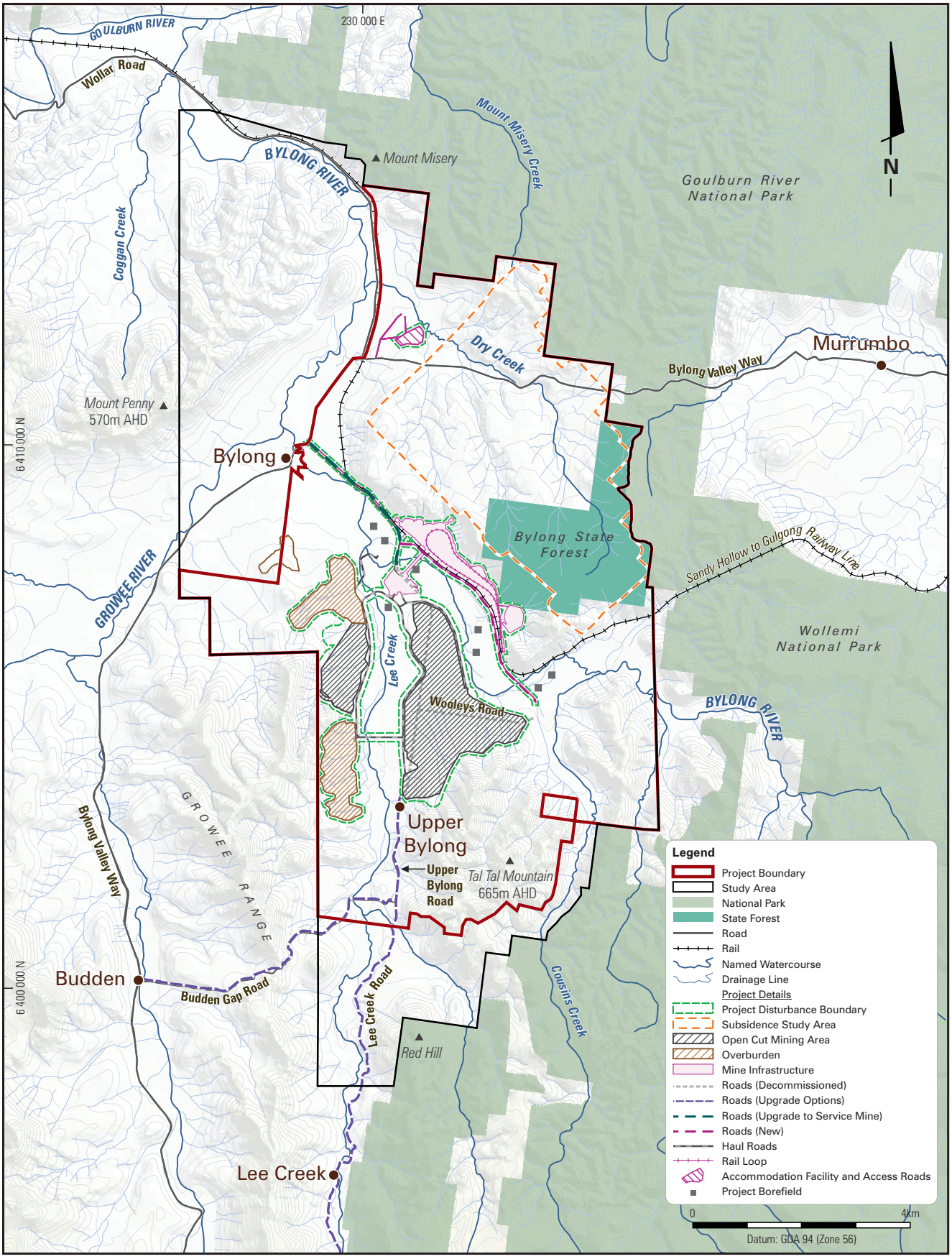
As explained within Section 7.4.3 of the EIS, once underground mining operations commence, the additional groundwater inflows and reduced site water demand from open cut activities increases the risk of water accumulation within the mine water management system. During extreme wet conditions, the surplus water is proposed to be managed within part of the open cut mining void remaining at the end of the open cut mining operations.

The site water balance prepared for the EIS considers the key demands and supplies of water throughout the life of the Project. The CHPP demands consider the mechanical dewatering technology which reduces the net demand of water required to process the coal.

The open cut mining void remaining at the end of open cut mining is proposed to be utilised as a critical buffer to assist in the management of surplus mine water in average to extreme wet conditions. At the completion of the longer term underground mining, it is proposed to pump any remaining surplus mine water in the open cut voids underground so that this mining area can be backfilled with stockpiled overburden material and revegetated.

2.1.3 Project Disturbance Footprint

The Project Disturbance Footprint comprises the area covered by the Project Disturbance Boundary and Subsidence Study Area (see Figure 1). The Project will require approximately 1,160 ha of surface disturbance which will generally be undertaken within the Project Disturbance Boundary.



HB BYLONG RTS Post Works 1538 F1 Conceptual Project Layout 22 07 2016

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Conceptual Project Layout

FIGURE 1

The Project Disturbance Boundary comprises the area to accommodate the key surface components of the Project with provision for minor adjustments during final design and development. Disturbance areas will be progressively rehabilitated as areas become practically available and where feasible these areas will be reinstated to their pre-mining land use.

Subsidence related impacts associated with the Underground Extraction Area will also result in influences to the surface, with the majority of material impacts occurring within the Subsidence Study Area. The Subsidence Study Area comprises the surface area within the predicted limit of vertical subsidence, determined by the maximum extent of the 26.5 degree angle of draw from longwall extraction and the predicted 20 mm subsidence contour. The Subsidence Study Area covers an area of approximately 1,714 ha as illustrated on Figure 1.

In addition to the Project Disturbance Footprint, other minor disturbance associated with ancillary works for the Project may also be required to occur within the Project Boundary.

The EIS identified three categories of disturbance (i.e. domains) within the Project Disturbance Footprint which are relevant to this report:

- **Indirect and temporary** impacts include impacts that do not directly disturb the land surface and are temporary e.g. the subsidence study area;
- **Direct and temporary** impacts include those which disturb the land's surface, however are short term by nature and will be rehabilitated to pre-mining status e.g. infrastructure areas; and
- **Direct and long-term impacts** will result in a long-term change in soil and landscape characteristics as a result of the complete removal of the soil profile and underlying rock strata during coal extraction activities and the emplacement of overburden material (i.e. open cut mining and overburden emplacement areas).

Table 1 provides a summary of disturbance related impacts as assessed in the EIS in accordance with the categories above. Figure 1 illustrates the Project Disturbance Footprint for the Project.

Table 1
Project Disturbance Footprint Impacts

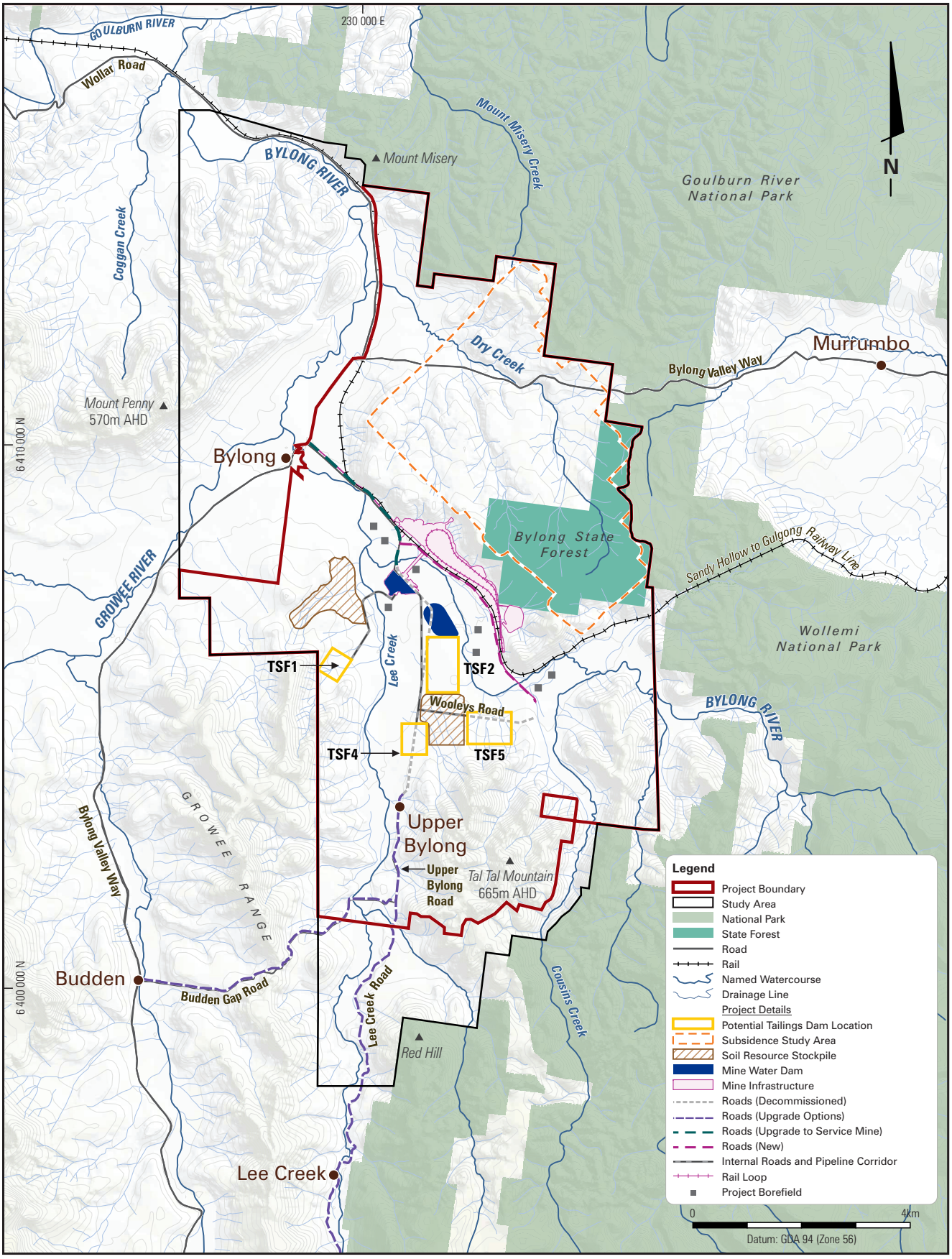
Category	Area (ha)
1. Indirect and Temporary Impacts	
a) Subsidence Study Area	1,714.3
Sub-Total	*1,714.3*
2. Direct and Temporary Impacts	
a) Haul Roads	118.3
b) Mine Infrastructure Area	85.0
c) Stockpile Area	11.1
d) Water Storage Facilities	26.5
Sub-Total	*240.9*
3. Direct and Long-term	
a) Internal Roads	73.5
b) Open Cut Mining Area	532.7
c) OEAs	225.0
d) Rail Loop	88.3
Sub-Total	*919.5*
Total	**2,874.7**

Source: Table 21 (SLR, 2015)

2.2 HYPOTHETICAL SCENARIO

The hypothetical scenario being compared to the Project comprises the same features as the Project, but simplistically excludes the open cut mining activities. The infrastructure and other components that are directly associated with the open cut mining activities for the Project are also not assumed to be required under this hypothetical scenario. However there will be various other components required for the hypothetical scenario which are conceptually illustrated in Figure 2 and discussed in the following sections.

The hypothetical scenario when compared to the Project reduces the recovery of the coal resource by approximately 27% to approximately 91 Mt of ROM coal.



HB BYLONG RTS Post Works 1538 F2 Conceptual Project Layout Hypothetical Scenario 21 07 2016

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Conceptual Project Layout
Hypothetical Scenario

FIGURE 2

The hypothetical scenario would also reduce the coal washery waste to approximately 14 Million loose cubic metres (Mlcm), exclusively from the processing of the underground ROM coal through the CHPP.

The number of employees would also reduce from a maximum of 470 full-time equivalent employees for the Project to approximately 275 people for the hypothetical scenario, consistent with the underground only phase of the Project. Royalties to the NSW Government are estimated to reduce from approximately $763 Million (or $290 Million present value) for the Project to approximately $539 Million (or $199 Million present value).

It is also noted that the hypothetical scenario does not take into account the significant expenditure (approximately $73.85 Million) which has already been made by KEPCO to acquire land which is specifically required for the preferred mine plan for the Project. The Project mine plan is the basis of the Application lodged to DP&E for SSD Development Consent under Division 4.1 of Part 4 of the EP&A Act. This land acquisition strategy may not have necessarily occurred if KEPCO had proceeded with an application for the hypothetical scenario. An underground only scenario was considered within the mine planning process and was categorically removed due to the adverse economic returns and the environmental risks associated with the management of processing waste in absence of the open cut mining area.

Relevant to this report, the hypothetical scenario would result in changes to the following aspects of the Project:

1. Management and disposal of coal processing waste from the CHPP;
2. Management of surplus mine water within the mine water management system; and
3. Changes to the Project Disturbance Boundary.

Each of these aspects are discussed within the following sections.

2.2.1 Management of Coal Processing Waste

Under the hypothetical scenario, an equivalent storage facility for the disposal and storage of coal processing waste materials generated from the processing of the underground coal would be required in comparison with co-disposal with overburden within the open cut mining areas.

As mentioned in **Section 2.1.1**, the Project incorporates the use of a mechanical dewatering process within the CHPP to dewater the fine reject materials. In absence of the mechanical dewatering process within the CHPP, fine tailing reject is pumped to containment ponds. Most recent Greenfield operations within NSW have not proposed to dispose of fine rejects in this manner. Therefore, some form of mechanical drying of fine tailings may need to be studied and included in both the capital and operating estimates.

Another option is to co-dispose of the coarse and fine reject together at a separate facility (i.e. subject to an agreement with another mine) which may facilitate a better outcome from an environmental point of view however it would be both practically onerous to undertake

(truck movements) and expensive economically. Therefore the mechanical dewatering process technology may not be appropriate for the hypothetical scenario with an underground only mine as discussed further below.

MineAdvice has assisted Hansen Bailey by reviewing and analysing the primary advantages and disadvantages of the options available for utilising or not utilising the mechanical dewatering process for the hypothetical underground only scenario. **Table 2** presents a summary of this analysis. As presented in **Table 2**, the decision upon whether or not to utilise this technology within the CHPP results in characteristically different reject types and quantities that require various alternative storage strategies. The use of the mechanical dewatering process results in a relatively "dry" reject material which is able to be transported by truck and may be co-disposed with overburden material (as proposed for the Project) or stored by way of "dry stacking". This material can be subsequently capped and rehabilitated without the requirement for these materials to be left for a period of time to dry prior to being rehabilitated.

Table 2
Comparison of Advantages and Disadvantages for Mechanical Dewatering Process

Mechanical Dewatering Process	Reject Material Description & Management	Advantages	Disadvantages
Used	Combination of dewatered coarse and dewatered fine reject material. "Dry stack facility" can be utilised.	• Dry stack potential of co-disposed coarse and fine rejects. • Risks of catastrophic reject facility failure can be reduced. • Progressive rehabilitation is possible. • Groundwater contamination through seepage can be reduced. • Dry stack facilities generally easier to close and rehabilitate.	• Truck haulage required to transport dry reject materials to disposal area (culminates in noise, dust and visual impacts – current issue with Project). • No option to store surplus site water (i.e. no capacity to utilise TSF dam type structures (as proposed for scenario not using mechanical dewatering process) to manage any surplus water accumulated under this scenario). • Increased requirements for water storage facilities – complications arise with underground only option and potential net surplus site water balance (i.e. loose advantages of evaporation). • May require the need for evaporation ponds or, alternatively high cost water treatment facilities etc. • Requires temporary TSF of some magnitude/duration to accommodate first few years of operation commissioning and redundancy for failed mechanical dewatering system during Life of Mine (LOM). Does not rule out the necessity for some level of TSF. • Better suited to low through-put operations. • High capital and operating costs attributed to filtration systems rendering other tailings disposal options more economic to develop. • Limited redundancy to cope with coal resource variation over LOM, i.e. clay contents and resultant incapacitation of mechanical dewatering systems.
Not Used	Combination of dewatered "dry" coarse reject material in addition to "wet" fine reject material (i.e. tailings slurry). "Impoundment facility" to be utilised.	• Lower processing and maintenance costs – improves underground only thermal coal operation viability. • Increased CHPP reliability and reduced downtime – improves underground only thermal coal operation viability. • Reject materials can be piped to disposal location (no noise/dust implications). Requires trade-off study to determine whether coarse and fine rejects are co-disposed.	• Requires large TSF. • Trade-off required to determine separation of co-disposal of coarse and fine reject materials. • Risk in areas of high seismicity. • Harder to close and rehabilitate. • Potential seepage issues. • Potential inrush issues (e.g. BHP Billiton Samarco 2015). • Complicated in wet climates. • Potential ecology issues due to wildlife attracted to TSFs (such as wildlife being inadvertently trapped)

However, should the mechanical dewatering process technology not be utilised, the CHPP would generate "wet" reject (or tailings) materials which must be stored within appropriate dam like structures. These dam like structures (or TSFs) would need to be established on the surface and will require to be drained (or decanted), dried, capped and rehabilitated. The process for rehabilitation of these areas involves a substantially longer period of time (i.e. Life of Mine and years beyond).

Mechanical dewatering processes are commonly utilised in current and proposed mining projects. However, current technologies can sometimes be cumbersome, problematic and unreliable based on specific coal seam parameters. That is, the action of clay materials reducing the process effectiveness. The level of redundancy in event of the mechanically dewatering process becoming incapacitated is greatly reduced for an underground only scenario as access to simple co-disposal storage on the surface is lost without open cut mining. Accordingly, there would still be a requirement for a temporary TSF to be located within the vicinity of the CHPP to deal with breakdowns, maintenance and design flaws of this technology.

Additionally, implementing this technology incurs increased coal processing costs and leaves the potential for significant operational impacts to eventuate should the mechanical dewatering process become incapacitated with no alternate reject disposal facilities available. The use of the mechanical dewatering process within the CHPP results in provides better water efficiency when compared to not utilising a mechanical dewatering process. Therefore using the mechanical dewatering process results in lower CHPP water demands and therefore more water to be managed within the water management system compared to not utilising the mechanical dewatering process. The combined effect of this water use efficiency with the additional groundwater inflows to the underground mining area (when compared to open cut mining), the reduced dust suppression demands and reduced water storage capacity in the absence of open cut mining areas will likely result in complications for the management of water.

For the purpose of this report, it is assumed that the hypothetical underground only option would not utilise the mechanical dewatering process within the CHPP and therefore generate a wet tailings material. This decision has been made as a result of the above comparison of options available and primarily comes down to this option providing a lower processing cost, more practical and operationally improved alternative for an underground only mine.

In Australia, tailings materials are usually transported and discharged as a slurry and stored within an impoundment like structure (MineAdvice pers. comm. July 2016). Several coal mines across NSW have trialled the storage of tailings material within their underground mine workings (for example Peabody's Metropolitan Mine (2013) and BHP Billiton's Westcliff Mine (2002)). However, it is understood that due to various inefficiencies, the trials of this disposal method have not resulted in conclusive outcomes for this method being utilised or considered for the longer term.

In the absence of an open cut void at the site or at another site in close proximity, the tailings would most likely be stored within an impoundment structure or structures developed on the surface. A TSF impoundment structure is similar to an embankment developed for a conventional water dam. However, there are some differences in the way the dam embankment can be constructed and therefore maintained in an environmentally safe manner.

Figure 3 illustrates some cross sections of varying TSF embankment designs and associated height options. TSFs can vary in height and may be single lift or include raised embankment designs. The selection of embankment design typically depends on the reject materials being stored and can result in a combination of TSF types. For the purpose of this report, the hypothetical scenario is assumed to adopt conventional impoundment storage facility attributes with an upstream embankment design. The upstream embankment design facilitates the development of the TSFs in lifts to increase the overall capacity whilst minimising the environmental risk and the overall footprint required to store the tailings materials.

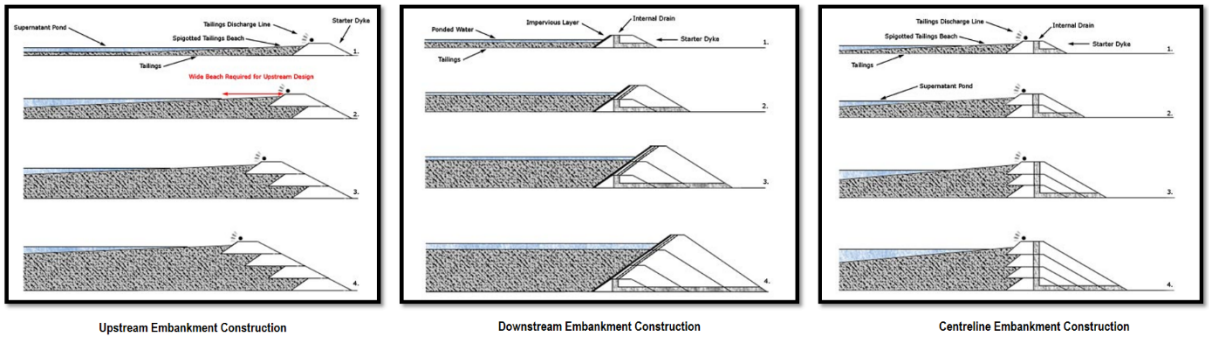

Figure 3
Conceptual TSF Embankment Designs and Height Options

As a guide, the Victorian Department of Economic Development, Jobs, Transport and Resources - Earth Resources (Victorian Department of Resources) broadly categorises TSFs by size. The Victorian Department of Resources defines large TSFs as those:

- With an embankment of 5 m or higher and a storage capacity of 50 Megalitres (ML) or more;
- With an embankment of 10 m or higher and a storage capacity of 20 ML or more;
- With an embankment of 15 m or higher, regardless of storage capacity; or
- Where the combined storage capacity of all TSFs on the site is greater than 50 ML.

The 14 Mlcm of reject material generated by the hypothetical underground only mine would exceed the 50 ML capacity and therefore would constitute a large TSF. However, in order to minimise the long term environmental risks related to large facilities, the size of individual TSFs can be reduced by height and volume stored.

Table 3 provides a comparison of the surface areas (not including dam embankments) required for the TSFs to accommodate the 14 Mlcm of reject materials with various average

heights. It is noted that the average heights are on the basis that the TSFs are on the level ground surface and assumes that the reject materials are partially dried. Additional capacity would be required for the management of tailings as opposed to partially dried reject materials. This is assumed to triple the required capacity of the TSFs (i.e. 42 Million m^3).

For the purposes of this report, four separate TSFs are proposed for the hypothetical underground only scenario which would be developed in 5 m lifts and dried prior to developing subsequent lifts. Figure 2 illustrates the location of the four TSFs for the hypothetical scenario. To achieve the capacity required to manage the tailing materials generated from the hypothetical scenario, the TSFs are assumed to be developed with up to three 4 m to 5 m lifts (i.e. up to a total height of 15 m).

Table 3
TSF Height to Surface Area Disturbance

TSF Average Height	Indicative Total Storage Area*	Comments
4 m (constituting "small" TSF)	3,500,000 m^2 (350 ha)	Larger footprint but lower perceived longer term risk post closure
10 m	1,400,000 m^2 (140 ha)	
15 m (constituting "large" TSF)	933,333 m^2 (93 ha)	Smaller site footprint but potential longer term risks post closure

** excludes the disturbance required for dam wall and other associated water management infrastructure.*

The development of TSFs requires suitable earthen material to construct an embankment which achieves the containment of the wet tailings material. In addition, suitable material is required to facilitate the capping and final rehabilitation of these areas once they have been filled. For the purposes of this report, it is assumed that suitable materials are available within the footprints of the proposed TSFs and associated infrastructure which can be salvaged prior to developing each facility. The salvaged soil and overburden material will be stored in emplacement areas within the Hypothetical Project Disturbance Boundary (as illustrated within Figure 2) to enable the later use for the development of embankments and to cap and rehabilitate the TSFs at the completion of mining operations. It is important to note that no detailed assessments, location suitability or detailed designs have been undertaken for any of the potential TSFs within this report.

2.2.2 Water Management

The hypothetical underground only scenario would require a number of changes to the water management system and water balance compared to that proposed for the Project.

The inclusion of a mechanical dewatering process within the CHPP for the Project improves the recovery of process water to enable the re-use of this water within the mine water management system. Excluding this technology from the CHPP would result in the reduction of process water recovered and therefore result in the overall water demands for the coal washing process per tonne of coal washed to increase. This necessity for the management

of additional mine water for the hypothetical scenario raises concern over the ability of the water management system to contain water on the site as discussed in **Section 3.4**.

It is also noted that coal production and associated coal processing for the hypothetical scenario would be less than that proposed for the Project, particularly during the initial years of longwall mining when the open cut operations are proposed for the Project.

The dust suppression demands for the open cut mining areas and the groundwater inflows into the open cut mining areas would also not be required for inclusion within the water balance for the hypothetical scenario. Similarly the rainfall runoff collected from the overburden emplacement areas within sedimentation dams would not be available for the water balance. However, rainfall runoff and decant water from the TSFs would require consideration within any water balance for the hypothetical scenario.

In light of there being no open cut mining areas under the hypothetical scenario, there is a reduced buffer available to manage any surplus water within the mine water management system. For the Project, any surplus water within the mine water management system is proposed to be held within the open cut mining areas. Therefore, the necessary mine water dams for the hypothetical scenario are likely to require a greater capacity than those proposed for the Project. However, such designs whilst having incorporated the most advanced engineering standards may not be sufficient to deal with major events without the available capacity provided by the open cut mining areas. Figure 2 illustrates the high level conceptual location of the anticipated additional mine water dams.

2.2.3 Project Disturbance Boundary

As discussed above, the hypothetical scenario comprises some varying components compared with the Project which would create surface disturbance. These features have been conceptually illustrated on Figure 2 and include:

- Four separate TSFs and associated embankment structures;
- Borrow pits and overburden storage areas;
- Water management infrastructure, including mine water dams, pipelines, pumps, diversion embankments etc; and
- Access roads and/or tracks.

The disturbance for the hypothetical scenario has conceptually been constrained to occur within the Project Disturbance Boundary which has been assessed for the Project. However, due to the exclusion of the open cut mine components and requirement for various additional features, the disturbance for the hypothetical scenario will be less and somewhat different than what is proposed for the Project.

Table 4 provides a high level understanding of the Hypothetical Project Disturbance Footprint, including the break down in items consistent with the Project. For the purpose of this report, the hypothetical scenario conceptually assumes that the subsidence study area will be consistent with the Project (see **Section 2.1.3**). Additionally, the disturbance areas for the CHPP, rail loop, Underground MIA and internal roads are assumed to be consistent with the Project.

Table 4
Hypothetical Project Disturbance Footprint

Category	Area (ha)
1. Indirect and Temporary Impacts (Remain Same As Project)	
b) Subsidence Study Area	1,714.3
Sub-Total	*1,714.3*
2. Direct Impacts (Remain Same As Project)	
a) Rail Loop & CHPP	88.3
b) Internal Roads	73.5
Sub-Total	*161.8*
3. Direct Impacts (Different to Project)	
a) Infrastructure (incl. Water Management Facilities and Underground MIA)	77.4
b) Internal Roads and Pipeline Corridors	10.6
c) Tailings Storage Facilities	153.3
d) Borrow Pits and Overburden Storage Areas	153.5
Sub-Total	*394.8*
Total	**2,270.9**

3 COMPARISON OF ENVIRONMENTAL IMPACTS

This section provides a high level comparison of the key environmental impacts associated with the Project and the hypothetical scenario.

3.1 PROJECT DISTURBANCE FOOTPRINT

As described within **Sections 2.1.3**, the Project Disturbance Footprint comprises the area covered by the Project Disturbance Boundary and Subsidence Study Area (see Figure 1). For both the Project and the hypothetical scenario, potential impacts associated with the Subsidence Study Area (1,714 ha) will remain consistent with that presented within the EIS, RTS and other supporting documents.

The Project will require approximately 1,160 ha of surface disturbance which will generally be undertaken within the Project Disturbance Boundary and comprises open cut mining areas, overburden emplacement areas, Underground Mine Infrastructure Area (MIA), Open Cut MIA, rail loop, CHPP, conveyor and water management system. Disturbance areas will be progressively rehabilitated as areas become practically available and where feasible will be reinstated to its pre-mining land use.

As explained in **Section 2.2.3**, the hypothetical scenario is assumed to conceptually require approximately 556.6 ha of surface disturbance which would generally be undertaken within the Project Disturbance Boundary defined for the Project. Surface disturbance for the hypothetical scenario would generally comprise the TSFs, overburden emplacement areas, tailings and water management pipelines as well as infrastructure entirely consistent with the Project such as the Underground MIA, rail loop, CHPP and other components of the water management system.

Under the hypothetical scenario, the outer embankments of the TSFs would be rehabilitated to assist in stabilisation and to minimise dust impacts. However, the final rehabilitation of the TSFs would not be practical until the completion of mining activities, due to their ongoing use throughout the life of mining. It is also noted that rehabilitation to achieve the reinstatement of land to its pre-mining land capability would be far more onerous for the hypothetical scenario than that proposed for the Project. This is generally as a result of the timing for final rehabilitation as opposed to the ability for progressive rehabilitation for the Project. Additionally, there would be the requirement for the storage of a large quantity of soil resources for several decades from initial construction as opposed to development on a progressive basis. This requirement to store such a large quantity of soil resources for a lengthy period would likely impact the ability to reinstate Biophysical Strategic Agricultural Land (BSAL) and achieve the outcome of establishing land with equal to or better Land and Soil Capability (LSC) to that currently present at the site.

3.2 ECOLOGY

An Ecological Impact Assessment (Appendix J of the EIS) was undertaken for the Project by Cumberland Ecology Pty Ltd. The Ecological Impact Assessment was also supported by work completed by Eastcoast Flora Surveys Pty Ltd.

The purpose of the Ecological Impact Assessment was to determine the likely impacts of the Project on the existing terrestrial and aquatic flora and fauna within the Study Area, including threatened species, populations and ecological communities listed under State and Commonwealth legislation.

The assessment has been undertaken generally in accordance with applicable NSW and Commonwealth legislation and the evolving planning policies relevant to the protection of biodiversity.

Section 3.13 provides a table listing the various vegetation communities predicted to be directly disturbed by the Project and the hypothetical scenario. **Table 5** provides a summary of the disturbance to threatened ecological communities for the Project and for the hypothetical scenario.

In addition to the potential for physical disturbance of threatened ecological communities, there is also an increased risk of fauna being inadvertently trapped within the TSFs which will need to be managed appropriately.

3.3 BIODIVERSITY OFFSET AREAS

A biodiversity offset strategy has been designed to compensate for any residual ecological impacts of the Project with the long term objective to provide a net benefit to flora and fauna within the locality and region by substantially increasing the proportions of native woodland and threatened species habitat under conservation tenure. The biodiversity offset strategy has involved the acquisition of properties which contain habitat for species predicted to be impacted by the Project for permanent conservation purposes. The biodiversity offset strategy has been developed with a primary focus on the threatened ecological communities which are listed under the *Environment Protection and Biodiversity Conservation Act 1999* and the *Threatened Species Conservation Act 1995*.

The requirement for a Biodiversity Offset Strategy remains for both the Project and the hypothetical scenario due to the direct disturbance proposed for both scenarios. The quantum of offsets required for the Project however, would be greater than that required for the hypothetical scenario due to the reduction in disturbance of threatened ecological communities (see **Table 5**).

Table 5
Indicative Disturbance of Threatened Ecological Communities

Vegetation Community	TSC Status	EPBC Act Status	Project Disturbance Boundary (ha)	Hypothetical Project Disturbance Boundary (ha)
Hunter Valley Footslopes Slaty Gum Woodland				
Slaty Box Woodland	VEC	Not Listed	11	1
Box Gum Woodland and Derived Native Grassland				
Yellow Box Woodland	EEC	CEEC	8	3
White Box Woodland (Grassy)	EEC	CEEC	53	21
DNG – 6(1)[A]: Yellow Box Woodland Derived Native Grassland	EEC	CEEC	6	5
DNG – 6(2)[B]: Yellow Box Woodland Derived Native Grassland	EEC	Not Listed	8	0
DNG – 7(1)[A]: White Box Woodland Derived Native Grassland	EEC	CEEC	68	65
DNG – 7(2)[B]: White Box Woodland Derived Native Grassland	EEC	Not Listed	63	0
Total EEC/VEC (TSC Act)			***217***	***95***
Total CEEC (EPBC Act)			***135***	***94***
TOTAL			**217**	**95**

Notes: Discrepancies may be present in totals due to rounding
[A] Meets both TSC Act and EPBC Act listing
[B] Meets TSC Act listing only

3.4 WATER

3.4.1 Background

A surface water impact assessment (Appendix L of the EIS) for the Project was undertaken by WRM Water and Environment. The purpose of the assessment was to characterise the existing catchments, develop a water balance for the Project with consideration of the water management system, determine the impacts to surface water and recommend measures to mitigate and manage these impacts.

Further, a Groundwater Impact Assessment (Appendix M of the EIS) was undertaken by AGE Consultants to characterise existing groundwater regimes, assess the impacts of the Project on the groundwater sources and other water users, quantify predicted inflows into the mining areas throughout the life of the Project and recommend measures to mitigate and manage these impacts.

Key considerations in the comparison of water related impacts between the Project and the hypothetical scenario are the management of reject materials generated during the underground scenario and the storage of surplus mine water during periods of extreme wet weather conditions. This necessity to store additional water in the hypothetical underground only scenario compared to the Project may also create the need for the release of water to the neighbouring environment as discussed in the following sections. Further, in light of the TSFs being developed on the surface rather than within an open cut mining area, there is an added increased risk of seepage of water from the TSFs to the neighbouring Bylong River alluvial aquifer.

3.4.2 Hypothetical Scenario Water Balance

In light of the changes to the management of reject materials generated from the CHPP and the reduced capacity within the water management system (not having the open cut mining void available), Hansen Bailey commissioned WRM to prepare a water balance assessment for the hypothetical scenario. A summary of the copy of WRM water balance assessment is provided below with a full copy of the report provided within **Appendix A**.

For the purposes of the hypothetical scenario water balance, the groundwater inflows to the underground mine have been utilised from the EIS based on the adjusted project years. That is, Project Year 1 of the hypothetical scenario utilised groundwater inflows from the underground mine for Project Year 5 of the Project. Project Years 1 to 4 for the hypothetical scenario are assumed to represent the initial development of the underground drifts and development of the main headings and initial longwall panel. Initial longwall mining is proposed to commence in Project Year 5 (equivalent to Project Year 9 for the Project) and proceed to Project Year 21 (equivalent to Project Year 25 of the Project).

A revised CHPP water balance has been developed based on the mine planning information available for the Project and assuming that there is no mechanical dewatering process within the CHPP. The CHPP water demands have been determined utilising the reported moisture contents of ROM and product coal, coarse rejects and an assumed coarse rejects/fine tailings fraction, fine tailings moisture content and fine tailings entrainment loss. In absence of the open cut mining area to store surplus water, the water balance assumes that all surplus water would be stored within a Mine Water Dam/s. Water decanted from the TSFs is assumed to be pumped directly to the Mine Water Dam/s.

The hypothetical scenario water balance has indicated the following in relation to the sizing of the required Mine Water Dam/s:

- There is a 1% probability that a storage capacity of greater than 1,350 ML will be required to contain excess mine water over the mine life;
- There is a 10% probability that a storage capacity of greater than 820 ML will be required to contain excess mine water over the mine life; and
- There is a 50% probability that a storage capacity of greater than 330 ML will be required to contain excess mine water over the mine life.

In comparison with the Project, there was a 1% probability that the open cut mining area would store more than 3,600 ML of mine water throughout the life of the Project. The hypothetical scenario requires a lesser storage capacity when compared to the Project due to the reduced water runoff captured within the mine water management system, significant moisture loss associated with the fine tailings entrainment loss and also the ability for evaporation of water from the TSFs to occur rather than management of CHPP recycled water within the water management system.

For the purposes of this report, it is considered that a 1,400 ML dam could be developed somewhere within the Project Disturbance Boundary to accommodate the surplus water predicted for the 1% very wet conditions scenario. Indicatively, assuming a 5 m average depth, this dam would have a surface area of approximately 30 ha (not including disturbance associated with the dam walls). Whilst a dam of this size is practically possible to avoid the need for mine water discharge, there would be substantial cost involved in its construction. A dam of this size also attracts a number of environmental risk management issues. This necessity to store additional water in the hypothetical underground only scenario compared to the Project may also create the need for the release of water to the neighbouring environment.

An assessment of the water requirements from the borefield has also been undertaken for the hypothetical scenario. The assessment has confirmed that the hypothetical scenario would require water from the borefield during extreme dry climatic conditions as follows:

- There is a 1% probability that more than 385 ML/a of borefield water will be required (in any one year) to satisfy site water demands over the mine life;
- There is a 10% probability that more than 230 ML/a of borefield water will be required (in any one year) to satisfy site water demands over the mine life.
- Substantial borefield water is not predicted to be required within median (i.e. 50% probability) and wet (90% probability) and very wet (99% probability) condition scenarios.

This predicted borefield demand is substantially less than the demand predicted for the Project within the EIS of around 1,170 ML (1% probability, in any one year). For the purposes of this report, it is assumed that the borefield as proposed for the Project would be available to supplement any additional water supplies required for the hypothetical scenario.

3.4.3 Water Balance Discussion

It is noted that the water balance completed for the hypothetical scenario has utilised the groundwater inflows to the underground mining area as predicted as the base case within the EIS. Within the most recent groundwater modelling, greater inflows have been predicted to occur into the underground mining area.

Increasing the predicted groundwater inflows to the underground mining area will increase the volume of water required to be managed within the mine water management system.

The CHPP water balance also assumes that 50% of the moisture content within the tailings to be pumped to the TSFs will be effectively lost from the water balance via entrainment within the tailings matrix. That this, the moisture within the consolidated tailings that is not able to be decanted via the decant pond. This assumption is generally consistent with previous experiences at neighbouring mining operations. However sensitivity analysis has confirmed that this assumption is sensitive within the water balance. Decreasing the moisture loss from the tailings to 40% results in the required dam capacity to more than double in size (i.e. to approximately 2,650 ML).

As highlighted within **Section 3.4.2**, whilst a dam with a capacity of 1,400 ML is practically possible to construct, developing a dam of this size comes at a considerable cost and management liability. The above discussion identifies the potential for the volume of water to be managed within the water management system to increase. Therefore the primary objective of the mine water management system to contain all mine water may not be possible for the hypothetical scenario in the absence of the open cut mining areas to assist with the management of surplus mine water during very wet periods. As a result, mine water may need to be released into the natural environment.

3.4.4 Other Water Management Risks

In addition to the containment of mine water within the water management system, the development of TSFs on the surface also raises possible risks associated with seepage of saline water to the natural environment and the potential risks associated with the failure of the TSF embankments.

If the hypothetical scenario was to be developed, it is envisaged that a considerable amount of detailed design and engineering work would be required to ensure that the TSFs were able to safely contain the tailings and minimise any seepage to the neighbouring environment. In addition to the detailed design, various monitoring and management actions would need to be developed and implemented throughout the life of the hypothetical scenario to ensure that the geotechnical stability of the TSFs is not compromised and as such result in adverse environmental impacts. This management regime is understood to be standard practice for developments containing large dam structures such as those under the hypothetical scenario.

Whilst TSFs can be appropriately managed, the risk of embankment failure resulting in significant impacts to the environment would be present to some degree throughout the life of the hypothetical scenario and beyond.

3.5 AIR QUALITY

An Air Quality and Greenhouse Gas Impact Assessment (Appendix O of the EIS) was undertaken for the Project by Pacific Environment Limited. The purpose of the assessment was to quantitatively predict and assess the air quality impacts at receivers in the vicinity of the Project and to recommend measures to account for and manage any potential impacts above the applicable criteria.

Control of dust emissions was a key consideration in the design of the Project. The mine plans for Years 3, 5 and 9 were selected for modelling purposes as they represent the progression of the Project and the years in which the worst case impacts are likely to occur due to the location of operations and the potential to generate air quality impacts.

The results of the dispersion modelling indicate that the Project is not predicted to contribute to exceedances of the relevant air quality criteria at any private receivers (either due to the Project alone, or cumulatively).

Similarly, there is potential for dust generation from the construction of the TSFs and also, as the moisture is evaporated from the tailings materials, there is a period of time where large surface areas of exposed dry reject material will be subject to wind erosion, prior to the addition of a subsequent layer of tailings waste or capping. Appropriate dust management measures will need to be implemented to minimise nuisance impacts.

3.6 NOISE

A Noise and Blasting Impact Assessment (Appendix Q of the EIS) for the Project was completed by Pacific Environment Limited. The assessment included quantitative consideration of construction noise, operational mining noise, offsite road and rail noise, sleep disturbance, low frequency noise and cumulative noise impacts. It also assessed blasting impacts on people, livestock and property.

The Noise and Blasting Impact Assessment concluded that with the adopted noise mitigation measures, 11 receivers are predicted to be residually affected greater than the relevant assessment criteria. Two receivers are predicted to be significantly impacted (greater than 5 decibels above the intrusive criteria) and six receivers are predicted to be moderately impacted by the Project (between 2 and 5 decibels above the intrusive criteria). The remaining three receivers are predicted to experience negligible impacts from the Project (between 1 and 2 decibels above the intrusive criteria).

In accordance with the requirements of the *Voluntary Land Acquisition and Mitigation Policy*, the moderately impacted receivers will be subject to voluntary at-property mitigation rights. Significantly impacted receivers will be subject to voluntary at-property mitigation and/or property acquisition rights.

Under the hypothetical scenario, there would continue to be a potential for noise generation from various activities, including:

- Operation of the CHPP;
- Construction earthwork activities for the development of TSFs, including subsequent lifts on these facilities;
- Use of pumping infrastructure for the transfer of the wet reject materials and water management; and
- Final earthworks associated with the capping and rehabilitation of the TSFs.

Noise impacts associated with the hypothetical scenario are expected to remain below the maximum noise impacts which have been predicted for the Project.

3.7 VISUAL

A Visual Impact Assessment (Appendix Y of the EIS) for the Project was completed by JVP Visual Planning and Design. The assessment included a description of the character of the existing visual landscape and assessed the potential visual and lighting impacts associated with the various Project surface components, including the open cut mining areas and associated surface infrastructure.

The Visual Impact Assessment concluded that the open cut mining areas and associated OEAs will create a visual impact for a period of time until the rehabilitation of the exposed faces is completed which will reduce these impacts to moderate to low as mining generally proceeds behind the rehabilitated exposed faces of the OEAs.

Under the hypothetical scenario the disturbance areas will be less when compared to the Project, however there will be various four separated TSFs to be developed within a similar footprint to the Project. As explained within **Section 2.2.1**, these TSFs will be developed in 5 m lifts as capacity is reached. The outer faces of each lift will be rehabilitated in order to minimise the visual contrast and effects on the landscape. There will be various soil resource stockpiles or OEAs which will be required for the hypothetical scenario similar to the Project.

Whilst the TSFs can be designed to minimise this effect from sensitive view locations, the visual impacts of a large black decolourisation within the Hypothetical Surface Disturbance Area would be present for the Life of Mine as the TSFs are progressively filled and each lift is developed.

Whilst the visual impacts of the hypothetical scenario are likely to be less than the Project primarily as a result of less disturbance, they will exist for the life of the mine and would still need to be appropriately managed.

3.8 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE

An Aboriginal archaeological and cultural heritage impact assessment (Appendix S of the EIS) was undertaken by RPS Australia East. The purpose of the assessment was to identify the Aboriginal archaeological and cultural heritage resource within the Project Boundary.

The assessment included a detailed desktop review of previous studies, search of the NSW Office of Environment and Heritage's Aboriginal Heritage Information Management System and a comprehensive field survey of the Study Area undertaken over a five week period, with members of the Aboriginal community. All potential impact areas within the Study Area were covered, including the Subsidence Study Area and the Project Disturbance Boundary.

As presented within the EIS, the Project will result in the direct disturbance of one artefact scatter plus Potential Archaeological Deposit (PAD), one PAD, three modified trees, two cultural features, 38 artefact scatters and 57 isolated finds.

Consistent with that described within **Section 3.1**, the disturbance associated with the hypothetical scenario is constrained within the Project Disturbance Boundary, however will be less than that proposed for the Project. Utilising the information from Appendix S of the EIS the hypothetical scenario would result in the disturbance of three modified trees, 12 artefact scatters and 28 isolated finds.

3.9 HISTORIC HERITAGE

A Historic Heritage Impact Assessment (Appendix T of the EIS) was undertaken by AECOM Australia. The purpose of the assessment was to identify the historical heritage sites in the vicinity of the Project and to assess the impacts to these sites. A total of 18 sites were assessed to be of heritage significance within and directly adjacent to the Study Area. There are no heritage items or sites within the Project Boundary listed on statutory UNESCO, Commonwealth or NSW or Local government lists, registers or schedules.

Consistent with the EIS, the Project will result in the direct disturbance of Bylong Upper Public School, Cheese Factory Remains, Our Land of the Sacred Heart Catholic Church and Cemetery, Renfrew Park Remains 1 & 2, Upper Bylong Post Office and Store, Upper Bylong Hall and a portion Tarwyn Park Farm Complex. Further to this, the Project will result in vibration impacts associated with blasting within the open cut mining areas to the Harley Hill Farm Complex and Cottage, Swiss Cottage, portion of Tarwyn Park Farm Complex, and Cottage Chimney Remains.

Consistent with that described within **Section 3.1**, the disturbance associated with the hypothetical scenario is constrained within the Project Disturbance Boundary, however will be less than that proposed for the Project. Further to this, the hypothetical scenario would not require the use of blasting activities which are proposed as part of the Project. Accordingly, those heritage items which were predicted to be impacted by blast vibration would not experience these impacts as a result of the hypothetical scenario.

Conceptually, the TSFs and associated disturbance areas have been specifically located for this report in order to avoid the heritage items which were predicted to be directly impacted by the Project. In particular the hypothetical scenario has been designed to avoid impacts to the Bylong Upper Public School (acquired by KEPCO in 2016) and the former Our Land of the Sacred Heart Catholic Church and Cemetery (acquired by KEPCO in 2014) which are located within the proposed Eastern Open Cut Mining Area for the Project.

Utilising the information from the Historic Heritage Impact Assessment (Appendix T of the EIS), the hypothetical scenario would result in the disturbance to the Swiss Cottage and Tarwyn Park Horse Burials.

3.10 STRATEGIC AGRICULTURAL LAND

A Soils, Land Capability and Strategic Agricultural Land Assessment (Appendix V of the EIS) was undertaken by SLR Consulting. The purpose of the assessment was to identify the soil types, land capability and the available soil resources to be managed for rehabilitation within the Study Area.

The Project will result in the direct disturbance of approximately 423 ha of Biophysical Strategic Agricultural Land (BSAL) and approximately 700 ha of mapped Equine Critical Industry Cluster (Equine CIC). KEPCO has committed to reinstating the 423 ha of BSAL within the Project Disturbance Boundary.

The hypothetical scenario would result in the disturbance of approximately 243 ha of BSAL and approximately 354 ha of land which is mapped as Equine CIC. Unlike the Project where rehabilitated land is proposed to be rehabilitated to BSAL and CIC, there will be no disturbed areas amenable to recreation under the hypothetical scenario.

It should be noted that these lands have been acquired by KEPCO to allow the Project Mine Plan which is subject of the SSD Application being assessed, based on the original SEARs.

Further unlike the Project, the availability of areas for progressive rehabilitation for the hypothetical scenario will be dependent upon the time taken for tailings to sufficiently dry to enable capping and final rehabilitation. Accordingly, the hypothetical scenario is dissimilar to the Project where rehabilitation activities (including the reinstatement of BSAL) is able to occur on a progressive basis as the open cut mining areas are developed and become practically available.

Due to the underlying material and the extended period of time between the initial disturbance (i.e. construction of the TSFs) and the final capping and rehabilitation of the TSFs and other disturbance areas under the hypothetical scenario, it is unlikely that the reinstatement of BSAL would be a viable and practical rehabilitation objective. Whilst final rehabilitation activities for the hypothetical scenario could aim to achieve a similar land capability as was previously present post mining, it would be an impractical rehabilitation objective to reinstate of BSAL or Equine CIC on top of the TSFs.

3.11 SOILS

Utilising information from the Soils, Land Capability and Strategic Agricultural Land Assessment (Appendix V of the EIS), **Table 6** has been developed to provide a comparison of the areas of disturbance of the various Land and Soil Capability (LSC) Classes for the Project and for the hypothetical scenario.

3.12 REHABILITATION

Section 7.15 of the EIS describes the progressive rehabilitation activities which are proposed to take place throughout the life of the Project. Disturbance areas will be progressively rehabilitated as areas become practically available and where feasible these areas will be reinstated to their pre-mining land use.

Under the hypothetical underground only scenario, the outer embankments of the TSFs would be rehabilitated to assist in stabilisation and to minimise dust impacts. However, the final rehabilitation of the TSFs would not be practical until the completion of mining activities, due to their ongoing use throughout the life of mining. The process for rehabilitation of these areas involves a substantially longer period of time (i.e. Life of Mine and years beyond).

It is also noted that rehabilitation to achieve the reinstatement of land to its pre-mining land capability and reinstatement of BSAL would be far more onerous for the hypothetical scenario than that proposed for the Project. This is generally as a result of the timing for final rehabilitation as opposed to the ability for progressive rehabilitation for the Project.

3.13 SUMMARY OF ENVIRONMENTAL IMPACTS

Whilst the environmental impacts of the Project are well known through the EIS and associated assessments, the impacts of the hypothetical scenario have been developed based on the high level understanding of this conceptual scenario which has not been subject to detailed design. A summary of the potential environmental impacts for the Project and the hypothetical scenario is provided within **Table 7**.

Table 6
Comparison of Impacts to LSC Class

LSC Class	Project Disturbance Boundary (ha)	Hypothetical Project Disturbance Boundary (ha)
Class 3	178.9	171.9
Class 4	271.6	99.2
Class 5	526.5	193.8
Class 6	167.8	89.1
Class 7	15.6	2.5

Table 7
Summary of Environmental Impacts for the Project and the Hypothetical Scenario

Area	Disturbance (ha)	Vegetation Communities (ha)	Heritage	Verified BSAL (ha)	CIC (ha)	Soils
Project (Project Disturbance Boundary only, Excludes Subsidence Study Area)						
	1,160.4	Slaty Box Woodland: 11 Yellow Box Woodland: 8 White Box Woodland (Grassy): 54 White Box Woodland (Shrubby): 71 Coastal Grey Box Woodland: 31 Fuzzy Box Woodland: 5 Blakely's Red Gum / Apple Riparian Forest: 5 Shrubby Regrowth: 40 Cypress Pine Forest: 4 DNG River Oak / Redgum Riparian Woodland and Blakely's Redgum / Apple Riparian Forest: 11 DNG Yellow Box Woodland: 15 DNG White Box Woodland: 174 DNG Slaty Box Woodland: 31 DNG Coastal Grey Box Woodland: 241 DNG Fuzzy Box Woodland: 53 Cultivated Lands: 386 Other (cleared, planted vegetation): 21	**Aboriginal Heritage** 1 Artefact Scatter + PAD 1 PAD 3 Modified Tree 2 Cultural Feature 38 Artefact Scatter 57 Isolated Find **Historic Items Direct Disturbance** Bylong Upper Public School Cheese Factory Remains Our Land of the Sacred Heart Catholic Church and Cemetery Renfrew Park Remains 1 & 2 Upper Bylong Post Office and Store Upper Bylong Hall Portion Tarwyn Park Farm Complex	423.1	700	Class 3: 178.9 Class 4: 271.6 Class 5: 526.5 Class 6: 167.8 Class 7: 15.6

Area	Disturbance (ha)	Vegetation Communities (ha)	Heritage	Verified BSAL (ha)	CIC (ha)	Soils
			Historic Items Vibration Impacts Harley Hill Farm Complex and Cottage Swiss Cottage Portion Tarwyn Park Farm Complex Cottage Chimney Remains			
Hypothetical Scenario (Direct Disturbance only, Excludes Subsidence Study Area)						
Total	556.55	Blakely's Red Gum: 5.87 Cleared Cultivated: 44.11 DNG Coastal Grey Box Woodland: 175.91 DNG: Fuzzy Box Woodland: 40.22 DNG Riparian Woodland: 4.95 DNG White Box Woodland: 65.09 DNG Yellow Box Woodland: 5.11 DNG Slaty Box Woodland: 8.52 Coastal Grey Box Woodland: 17.32 Shrubby Regrowth: 0.18 Slaty Box Woodland: 1.41 White Box Woodland (Grassy): 21.12 White Box Woodland (Shrubby): 2.49 Fuzzy Box Woodland: 4.85 Yellow Box Woodland: 2.89 Other (cleared, planted vegetation, roadways etc.): 156.5	**Aboriginal Heritage** 3 Modified Tree 12 Artefact Scatter 28 Isolated Find **Historic Items Direct Disturbance** Swiss cottage partial Tarwyn Park Horse Burials	243.18	353.86	Class 3: 171.86 Class 4: 99.18 Class 5: 193.83 Class 6: 89.11 Class 7: 2.46

Area	Disturbance (ha)	Vegetation Communities (ha)	Heritage	Verified BSAL (ha)	CIC (ha)	Soils
Infrastructure (incl. Mine Water Dams)	165.65	Blakely's Red Gum: 2.24 Cleared Cultivated: 44.11 Planted Vegetation: 0.2918 DNG Coastal Grey Box Woodland: 37.56 DNG: Fuzzy Box Woodland: 26.04 DNG Riparian Woodland: 0.45 DNG White Box Woodland: 3.94 DNG Yellow Box Woodland: 0.73 Cleared Planted Vegetation: 0.12 Coastal Grey Box Woodland: 11.14 Shrubby Regrowth: <0.01 Slaty Box Woodland: <0.01 White Box Woodland (Grassy): 8.30 White Box Woodland (Shrubby): 2.24 Yellow Box Woodland: 1.07 Not Vegetated: 3.47	**Aboriginal Heritage** 11 Isolated Finds 7 Artefact Scatters **Historic Items Direct Disturbance** Tarwyn Park Horse Burials	41.08	103.92	Class 3: 5.445 Class 4: 33.1 Class 5: 103.8 Class 6: 23.36
Soil Resource Stockpile 1	86.04	DNG Coastal Grey Box Woodland: 7.961 DNG Fuzzy Box Woodland: 12.02 DNG White Box Woodland: 40.61 Planted Vegetation: 0.1850 Fuzzy Box Woodland: 0.8093	**Aboriginal Heritage** 6x Isolated Finds	56.82	86.04	Class 3: 56.82 Class 6: 29.22
Soil Resource Stockpile 2	67.5	DNG Slaty Box Woodland: 2.206 Coastal Grey Box Woodland: 0.5485 DNG Coastal Grey Box Woodland: 62.78 DNG White Box Woodland: 0.2426 Slaty Box Woodland: 0.3710 Shrubby Regrowth: 0.06016	**Aboriginal Heritage** 6x Isolated Finds 1x Artefact Scatter	50.90	31.62	Class 3: 53.68 Class 4: 0.5299 Class 5: 7.602 Class 6: 5.658

Area	Disturbance (ha)	Vegetation Communities (ha)	Heritage	Verified BSAL (ha)	CIC (ha)	Soils
Internal Roads and pipeline corridors	10.56	Coastal Grey Box Woodland: 0.10 Fuzzy Box Woodland: 0.04 DNG Coastal Grey Box Woodland: 1.33 DNG Fuzzy Box Woodland: 0.31 DNG White Box Woodland: 0.00 Planted Vegetation: 0.02		4.511	9.625	Class 3: 4.511 Class 4: 3.454 Class 5: 1.702 Class 6: 0.1244 Class 7: 0.7691
Internal Roads(realignment of Upper Bylong Road)	73.5	Blakely's Red Gum / Apple Riparian Forest: 3.632 DNG Fuzzy Box Woodland: 1.842 DNG Riparian Woodland: 4.503 DNG White Box Woodland: 1.729 DNG Yellow Box Woodland: 4.384 Planted Vegetation: 0.6097 Shrubby Regrowth: 0.1226 Yellow Box Woodland: 1.819	1x Isolated Find 1x Artefact Scatter	27.84	31.53	Class 3: 37.73 Class 4: 5.353 Class 5: 26.80 Class 6: 1.904 Class 7: 1.663
TSF1	20.2	DNG White Box Woodland: 7.37 White Box Woodland (Grassy): 11.10 White Box Woodland (Shrubby): 0.25 Not Vegetated: 1.48	None	13.07	20.15	Class 4: 18.16 Class 5: 1.99
TSF2	58.9	Coastal Grey Box Woodland: 3.08 DNG Coastal Grey Box Woodland: 30.10 Fuzzy Box Woodland: 4.0 Planted Vegetation: 0.12 Not Vegetated: 21.6	**Aboriginal Heritage** 2 Artefact Scatter	15.15	57.69	Class 4: 26.23 Class 5: 12.93 Class 6: 19.71
TSF4	26.4	DNG Coastal Grey Box Woodland: 13.58 DNG White Box Woodland: 2.18 Not Vegetated:10.64	None	16.51	12.92	Class 3: 13.67 Class 4: 12.36 Class 6: 0.3216

Area	Disturbance (ha)	Vegetation Communities (ha)	Heritage	Verified BSAL (ha)	CIC (ha)	Soils
TSF5	47.8	Coastal Grey Box Woodland: 2.45 Planted Vegetation: 0.14 DNG White Box Woodland: 9.09 White Box Woodland (Grassy): 1.72 Slaty Box Woodland: 1.04 DNG Slaty Box Woodland: 6.31 DNG Coastal Grey Box Woodland: 22.42 Not Vegetated: 4.63	**Aboriginal Heritage** 1 Artefact Scatter 3 Modified Tree 4 Isolated Find	17.30	None	Class 5: 39.01 Class 6: 8.825

4 DISCUSSION & PROJECT JUSTIFICATION

As explained within Section 3.17 of the EIS, the process of developing the mine plan and description for the Project has been the result of an exhaustive attempt to balance the environmental impacts of the Project against its economic viability. These mine planning scenarios have aimed at maximising the recovery of the NSW Government owned state significant coal resource within the Authorisations, whilst providing appropriate considerations to the key environmental, social and economic constraints. Initial mine plans comprised of up to seven open cut mining areas and several underground mining domains which were progressively refined, taking into consideration the social, environmental and economic constraints to achieve the preferred mine plan for the Project.

The above considerations involved refinements and adjustments to the Project mine plan, based on the original SEARs and in consultation with the relevant Government agencies (including DP&E, Department of Trade and Investment – Division of Resources and Energy and Department of Primary Industries Agriculture). KEPCO's decision to proceed with the Project Mine Plan has led to strategic land acquisitions of up to $73.85 Million that would allow the Project's economic balance based on the current Project Mine Plan to be approved by KEPCO Korea.

During the exhaustive mine planning process, the project team investigated a stand-alone underground only scenario. This scenario was considered to not be economically viable given the extensive costs of developing an underground mine in relation to the limited value of the thermal coal resource. This economic inefficiency of an underground only mine was further detailed within the Supplementary Mine Plan Justification Report which was included within the RTS. The mine planning process also identified that the underground only scenario would sterilise a material coal resource within the Authorisations which can only be safely and economically recovered by open cut mining techniques. Further, an underground only scenario was constrained by the identified need for developing an appropriate facility to store the reject materials from the processing of ROM coal produced from the underground mine.

KEPCO has indicated that the recovery of coal from the two small open cut mining areas is critical for the financial viability for the Project. Without these inclusions, the Project would be deemed to be internally non-approvable and the Project would sustain significant monetary losses. Such a scenario would impact investment confidence of nations such as South Korea. These proposed open cut mining areas are also essential components for the effective and efficient operation of the Project.

The open cut mining areas provide a suitable, safe and extremely cost effective receptacle for the storage of coal reject materials generated from the processing of underground coal and effectively avoid the longer term rehabilitation liabilities associated with the development of separate TSFs on the surface.

The combined open cut and underground mining operations also enables the final rehabilitation activities to create a landform resembling the natural environment with no final void within the landscape.

The open cut mining areas also provide the additional water storage capacity required to facilitate the effective management of greater groundwater inflows which are predicted to be experienced during the underground phase of the Project. Reducing the size of the two open cut mining areas from that proposed for the Project in order to avoid specific impacts would impact on the capacity available within the mining void for water storage and would also compromise the ability for rehabilitation activities to create a final landform resembling the natural landscape.

The EIS and supporting documentation provides a detailed assessment of the potential environmental, social and economic impacts of the Project. This documentation has also described numerous commitments by KEPCO to implement various monitoring, management and mitigation measures which will appropriately mitigate the identified impacts of the Project.

The hypothetical scenario would generally result in a reduced disturbance footprint when compared to the Project as a result of the exclusion of the open cut mining areas and associated overburden emplacement areas, however the hypothetical scenario is simply not a viable mining option. It is highlighted that the hypothetical scenario does not consider the substantial land acquisition by KEPCO of the adjacent properties deemed necessary for the Project mine plan and the multiples paid to market value that would not be recovered. With a reduced disturbance footprint, reduced impacts would be experienced by the hypothetical scenario to BSAL, Equine CIC, Aboriginal and historic heritage items and ecological values. The hypothetical scenario would also result in reduced noise, air quality and other amenity impacts when compared to the Project.

It is important to note that KEPCO has committed to various mitigation and management measures to mitigate any amenity impacts for the Project and has proactively commenced the implementation of these measures through progressing relevant land acquisitions with affected neighbours.

Whilst the hypothetical underground only scenario would potentially reduce the physical disturbance footprint and result in less amenity related impacts, this scenario raises additional issues relating to the appropriate management of coal processing waste materials, visual impacts of the TSFs and surplus groundwater inflows to the underground mining area. Further the hypothetical scenario raises concerns in relation to the timing for final capping and rehabilitation of the TSFs.

Whilst TSFs have been able to be appropriately managed at other sites, building TSFs will likely attract ongoing concerns and uncertainty by stakeholders over the geotechnical stability and possible failure of the embankments and resulting environmental impacts. In comparison, the Project as proposed will appropriately manage the partially dried reject materials by co-disposing with overburden and emplacing materials within the open cut mining voids which materially reduces the risk and uncertainty that may be present with utilising TSFs.

The water balance that has been undertaken for the hypothetical scenario has also raised concerns in relation to the management of groundwater inflows to the underground mine in the absence of the open cut mining area to store surplus mine water. The fact that groundwater inflows to the underground mining area are much greater than those into the open cut mining area and reduced demands for water during underground only mining highlights that the Project with the open cut mining void provides the most reliable alternative to manage surplus water onsite avoiding with certainty the need to discharge to the natural environment.

The timing for the final capping and rehabilitation of the TSFs also presents a longer term liability for the hypothetical scenario in comparison with the Project. For the hypothetical scenario, rehabilitation will be delayed, as the TSFs would be required to be substantially dried prior to capping this material. The timing for this is largely dependent upon the weather conditions and could take a considerable period of time following the completion of underground mining operations. This will result in a longer term visual impact on the landscape, and potentially result in a perceived disregard of community expectations for progressive rehabilitation.

The final rehabilitation and closure activities for the Project as proposed will be able to commence within the final years of underground mining operations. This is due to the partially dried reject materials being able to be capped and rehabilitated almost immediately after being emplaced as opposed to ensuring the materials are dried.

5 CONCLUSION

This report has been developed to provide DP&E with further context in relation to the implications of simply excluding the open cut mining component from the Project. This report provides a comparison of the potential environmental impacts and risks between the Project and the hypothetical underground only scenario.

KEPCO considers the hypothetical scenario is not a viable mining option. However, it would generally result in a reduced disturbance footprint when compared to the Project. The hypothetical scenario would remove the provision of a suitable, safe and extremely cost effective, receptacle for the storage of coal reject materials. Alternatively the hypothetical scenario would require the development of TSFs which would likely attract ongoing concerns and uncertainty by stakeholders over the geotechnical stability and possible failure of the embankments and resulting environmental impacts. Additionally, the hypothetical scenario does not consider the substantial land acquisition costs currently incurred by KEPCO which were deemed necessary for the Project.

Further, the hypothetical scenario raises various concerns relating to the management of mine water management. These concerns are predominantly around the management of groundwater inflows to the underground mine in the absence of the open cut mining area to store surplus mine water. Further the management of water within the TSFs presents a material change from the Project in terms of CHPP demand. The water balance modelling for the hypothetical scenario has identified the need for increasing the capacity of surface water storages and identifies the potential need to discharge to the natural environment.

Finally, the development of the Project will effectively avoid the longer term rehabilitation liabilities associated with the development of separate TSFs on the surface for the hypothetical scenario as discussed within this document. The delayed rehabilitation of the TSFs for the hypothetical scenario provide a longer term visual impact on the landscape is disparate to the current community expectations deemed essential for community and public confidence. The combined open cut and underground mining operations enables the appropriate management of coal processing waste and mine water throughout the life of the Project whilst the final rehabilitation activities being able to create a landform which resembles the natural environment with no final void within the landscape. This rehabilitation approach for the Project demonstrates to the community and public that rehabilitation is occurring progressively. The Project as proposed also provides the ability for rehabilitation activities to reinstate BSAL into the final landform which would be problematic under the hypothetical scenario.

It can be concluded from this investigation that not only would the hypothetical scenario result in the sterilisation of a material coal resource which can only be safely and economically recovered by open cut mining techniques, it does not provide a material reduction in environmental impacts when compared with the Project. As such, KEPCO does not consider the hypothetical scenario to be a suitable option nor an option that would be supported by the KEPCO Board as a viable investment.

APPENDIX A

Hypothetical Scenario Water Balance

Bylong Coal Project -

Water Balance Modelling for a Hypothetical Underground Mining Only Scenario

Hansen Bailey Pty Ltd

0887-03-E2, 18 August 2016

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1 Overview

WRM have previously undertaken a surface water impact assessment (WRM report 0887-01-P3 dated 18 June 2015) for the Bylong Coal Project (the Project), which included developing a water balance model of the proposed water management system. The surface water impact assessment is provided in Appendix L of the Bylong Coal Project Environmental Impact Statement (EIS).

Hansen Bailey (HB) has requested that WRM prepare a water balance assessment on an alternative hypothetical underground mining only scenario with the following changes to the mine plan and water management system:

- Mining operations to change from the combined open cut and underground operations to underground operations only.
- The waste disposal method changes from dry co-disposal (via belt press filter (BPF) technology) to traditional coarse rejects and fine tailings disposal.
- Construction and use of four tailings storage facilities (TSFs) to accept coarse reject and fine tailings materials generated from the processing of underground Run of Mine (ROM) coal.

The Project water balance model from the EIS has been revised to simulate the alternative hypothetical underground only scenario. The following sections describe the changes made to the EIS water balance model, the associated assumptions utilised within the revised water balance model and describes the results of the simulation in comparison with the Project.

2 Mine water balance model configuration

2.1 CONCEPTUAL WATER MANAGEMENT SYSTEM CONFIGURATION AND SCHEMATIC

An updated conceptual water management system schematic has been developed for the hypothetical scenario, and is presented in Figure 2.1. Key changes to the water management system are as follows:

- All open cut mining areas and associated sediment dams have been removed from the water management system. It is noted that various overburden and topsoil stockpile areas would be required for the hypothetical scenario which would contain separate erosion and sediment control structures. These would be managed separately from the mine water management system for the hypothetical scenario, and therefore have not been included in the water balance modelling.
- All infrastructure associated with open cut operations have been removed (including the OC MIA Dam).
- Four TSFs will supply water to the water management system through decant as well as evaporation;
- A new Mine Water Dam (MWD) would be required for the hypothetical scenario which functions as the primary excess water storage for the operations, and receives pumped groundwater from the underground and decant water from the TSFs. (For the Project, excess mine water is proposed to be stored in the open cut mining areas.)

2.2 MODELLED STAGING OF MINE PLANS

Modelling of the proposed operations under the hypothetical scenario has been split up into two phases:

- Underground construction activities, including initial longwall development (Project Year (PY) 1 to PY4); and
- Longwall mining (PY5 to PY21).

During the construction period (PY1 to PY4), there is minimal production throughput (maximum of 0.5 Million tonnes per annum (Mtpa) total ROM coal). During the longwall mining phase (PY5 to PY21), the total ROM coal production ranges between 3.6 and 6.3 Mtpa.

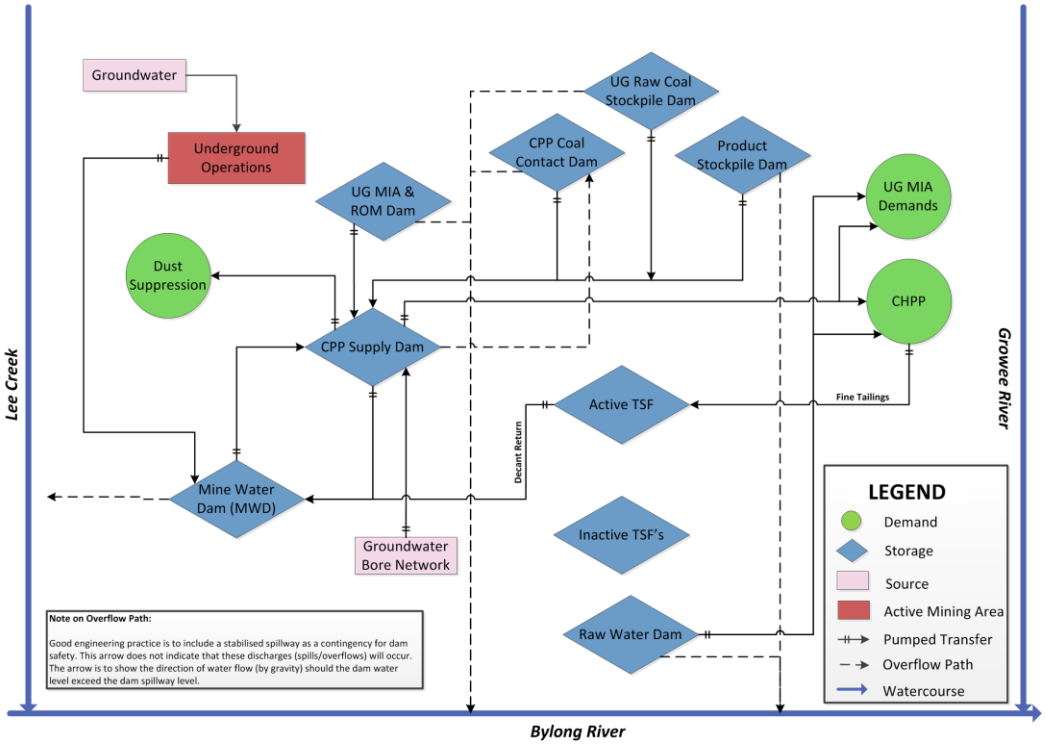

Figure 2.1 – Water management system schematic – hypothetical underground operations only scenario

2.3 TAILINGS DISPOSAL STRATEGY

The Underground Only scenario adopts a traditional coarse rejects and dry tailings waste disposal method, requiring four tailings storage facilities (TSF) over the life of the mine. Based on the high level information available for the hypothetical scenario, it is assumed that the TSF operations would be operated as follows:

- The initial 5m walls for all four tailings dams will be constructed by PY4, using materials recovered from the construction of the underground infrastructure and the footprints of the TSFs.
- The TSF's will be managed as two sets of pairs. Within each pair, one TSF will be active (receive waste material and be actively dewatered), while the other will be dried out.
- Once the first TSF in the pair is full, deposition will be redirected to the other TSF and it will be allowed to dry. During the drying period, the TSF wall will be lifted by 5m, ready to receive more tailings once the second TSF is full.
- This process is repeated until both TSF's have two 5m wall lifts (reaching a wall height of approximately 15m).
- Once the first pair of TSF's are full, this process will be repeated with the second pair.

For modelling purposes, we have assumed that over the Project life, one TSF will receive waste, and will be actively dewatered. The other 3 will capture runoff from their own surface areas, but will not be dewatered. Note that modelling of solids accumulation within the TSF has not been undertaken as part of current investigations.

2.4 WATER SOURCES

2.4.1 Groundwater inflows

Groundwater inflows to the underground mining area over the life of the Project are consistent with those adopted for the EIS, but have been adjusted to account for the revisions to the mine phasing. The estimates for underground groundwater inflows have been provided to WRM as "corrected" inflows. It is our understanding that these "corrected" inflows represent the groundwater rates which will require management within the water management system.

The adopted groundwater inflows rates have been modelled as annual averages, and are presented in Table 2.1 and Figure 2.2.

2.4.2 Groundwater bores

KEPCO has licences to extract approximately 2,644 units from the Bylong River water source as managed under the Hunter Unregulated and Alluvial Water Sources Water Sharing Plan (HUAWSP). This water is proposed to be used to supplement site water demands in excess of what is captured and stored on site.

Table 2.1 – Adopted groundwater inflows – hypothetical underground only scenario

Project Year	Total groundwater intercepted (ML/a)
PY1	7
PY2	10
PY3	13
PY4	14
PY5	1,130
PY6	1,167
PY7	1,140
PY8	1,077
PY9	983
PY10	927
PY11	970
PY12	845
PY13	682
PY14	1,465
PY15	1,345
PY16	1,358
PY17	1,204
PY18	1,109
PY19	1,437
PY20	932
PY21	1,404

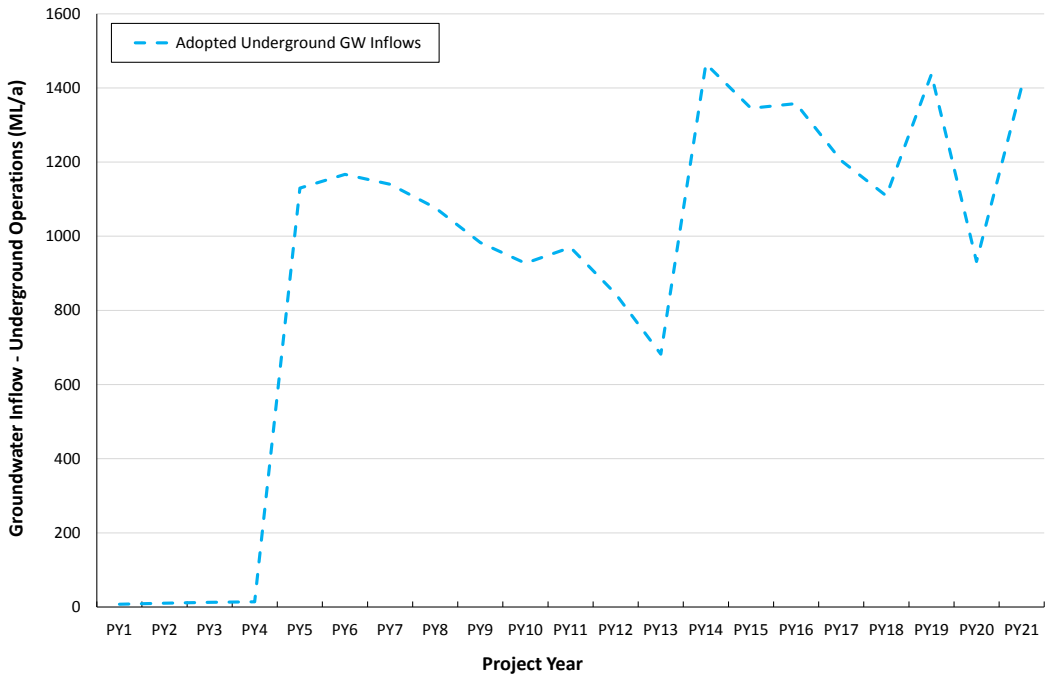

Figure 2.2 – Adopted groundwater inflows for hypothetical underground only scenario

2.5 WATER DEMANDS

2.5.1 Coal handling and preparation plant

The annual average water usage for the CHPP will vary over the mine life, depending on the ROM coal throughput. Bypass coal is not washed, and it is therefore not included in the CHPP demand calculations.

In the EIS analysis, CHPP water usage was calculated by multiplying the ROM coal throughput by a nominal L/ROM tonne net loss. This loss included moisture inputs from ROM moisture, and moisture outputs from product coal and the coarse and fine rejects stream (via the BPF).

With the generation of coarse rejects and fine tailings for the hypothetical scenario, the EIS approach is not valid. An updated CHPP water balance has been developed for the hypothetical scenario based on information provided by HB and a number of assumptions. These parameters are summarised below.

Where the parameter is listed as "reported", this value was sourced from the spreadsheet "*Combined_Production_Schedule_V8_Inventory_FS_adj DM_141124.xlsx*", provided to WRM by HB. Where the parameter is listed as "assumption", this value is an assumption based on WRMs experience with similar coal mines in the region, or a value agreed with HB.

- Washed ROM moisture content: 9.5% w/w (reported)
- Product moisture content: 11.0% w/w (reported)
- Coarse rejects moisture content: 7.0% w/w (assumption)
- Fine tailings moisture content: 66% w/w (mine advice)
- Coarse rejects fraction (dry): 40% (assumption)
- Fine tailings entrainment loss: 50% (assumption)

The fine tailings entrainment loss represents the entrainment of moisture within the fine tailings matrix, which is not released as excess water once the tailings have consolidated. This means that 50% of the moisture in the fine tailings stream is available for evaporation from the decant pond surface, and dewatering for re-use within the water management system.

The CHPP water balance for the underground only scenario is presented in Table 2.2 and Figure 2.3.

2.5.2 Haul road dust suppression

The assumed daily average dust suppression demand for underground operations is 100 ML/a (based on discussions with HB).

2.5.3 Underground operations and UG MIA demand

The assumed demand for underground operations has been estimated as follows (based on discussions with HB, and is generally consistent with the EIS assumptions):

- PY1 to PY2: 50 ML/a
- PY3 to PY4: 100 ML/a
- PY5 to PY21: 500 ML/a

Estimates of underground mine infrastructure area demands vary as follows (based on EIS assumptions):

- construction phase – 5.2 ML/a (PY1 to PY4)
- longwall mining – 6.5 ML/a (PY5 to PY21)

Table 2.2 – CHPP water balance

Project Year	Washed ROM (wet)	Washed ROM moisture	Product moisture	Coarse rejects moisture	Fine tailings moisture (to TSF)	CHPP makeup requirement
	Mtpa	ML/a	ML/a	ML/a	ML/a	ML/a
PY1	0.0	0.0	0.0	0.0	0.0	0.0
PY2	0.1	6.4	5.7	0.5	18.1	17.8
PY3	0.5	49.8	39.9	4.6	176.6	171.3
PY4	0.4	35.5	23.9	4.4	168.4	161.2
PY5	3.4	319.1	201.1	42.5	1,645.1	1,569.7
PY6	3.6	341.2	277.6	30.3	1,170.5	1,137.1
PY7	5.6	536.5	447.7	44.8	1,733.4	1,689.5
PY8	6.0	573.9	491.5	44.9	1,736.7	1,699.2
PY9	5.9	563.5	486.2	43.2	1,671.2	1,637.0
PY10	4.4	416.3	380.3	26.7	1,034.7	1,025.5
PY11	4.7	442.1	426.4	22.9	887.5	894.7
PY12	3.7	350.9	330.6	20.1	777.4	777.3
PY13	3.6	337.6	310.3	21.2	821.9	815.8
PY14	5.9	561.7	348.5	76.2	2,948.1	2,811.1
PY15	5.0	471.2	308.3	60.0	2,322.8	2,220.0
PY16	5.1	481.2	311.9	62.0	2,399.5	2,292.3
PY17	5.0	471.2	316.3	58.1	2,247.3	2,150.5
PY18	5.1	488.7	351.5	54.5	2,109.7	2,027.0
PY19	5.3	500.3	372.6	52.7	2,040.5	1,965.5
PY20	4.6	439.4	320.4	48.0	1,856.4	1,785.3
PY21	5.6	528.5	399.3	54.3	2,100.8	2,026.0

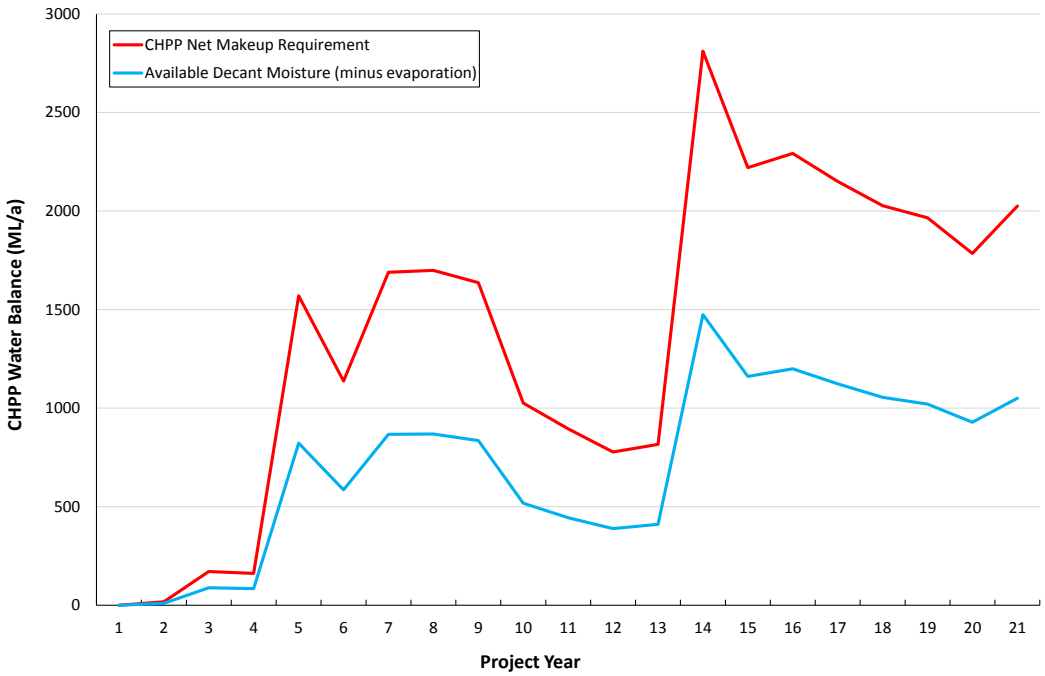

Figure 2.3 – Adopted CHPP makeup requirement

2.5.4 Catchment areas

Catchment areas for each of the site storages directly associated with underground mining activities are unchanged from the EIS assessment. The maximum surface area and catchment of the MWD has been based on a maximum dam depth of 5m to the spillway invert. It is assumed that the MWD could be located within the Project Disturbance Boundary.

The TSFs for the hypothetical scenario also generate a catchment area which needs to be considered within the water balance.

A summary of catchment areas for the underground only mine configuration is provided in Table 2.3.

Table 2.3 – Storage catchment areas

Storage	Catchment area (ha)
CHPP Supply Dam	1.7
CHPP Coal Contact Dam	10.3
UG Raw Coal Stockpile Dam	7.6
Product Stockpile Dam	10.8
UG MIA Dam	9.3
Raw Water Dam	96.6
Mine Water Dam	30.0
TSF 1	20.2
TSF 2	58.9
TSF 4	26.4
TSF 5	47.9

2.5.5 Other parameters

All other parameters including mine water storage capacities (apart from the new MWD and TSFs), catchment yield parameters and pump capacities are unchanged from the EIS modelling.

3 Water balance model results

3.1 INTERPRETATION OF RESULTS

In interpreting the results of the water balance assessment for the hypothetical scenario, it should be noted that the results provide a statistical analysis of the water management system's performance over the 21 years of mine life, based on 104 realisations with different climatic sequences.

The 50th percentile probability represents the median results, the 10th percentile represents 10% exceedance (i.e. wet conditions) and the 90th percentile results represent 90% exceedance (i.e. dry conditions). There is an 80% chance that the result will fall within the 10th and 90th percentiles and a 98% chance the result will fall between the 1st and 99th percentiles. Importantly, it is noted that a percentile trace shows the percentile chance of a particular value on each day, and does not represent continuous results from a single model realisation e.g. the 50th percentile trace does not represent the model time series for median climatic conditions.

A single realisation can also be selected from the 104 modelled realisations in order to show the water management system's actual performance (not a statistical representation) for a particular climate sequence. This approach has been used for calculation of the overall water balance.

3.2 BOREFIELD WATER SUPPLY REQUIREMENTS

Figure 3.1 shows the total annual modelled demand for water from groundwater bores over the life of the hypothetical scenario. The results indicate that the annual bore water requirements are generally highest during the last 5 years of the Project, when CHPP production throughput is highest.

The annual bore water requirements are lower than those reported in the EIS assessment (WRM, 2015), which was a combined open cut and underground operation. The peak annual bore water requirement for very dry conditions (1%ile) is around 385 ML/a in PY18, compared with 1,170 ML in PY4 for the EIS assessment (which was during open cut operations).

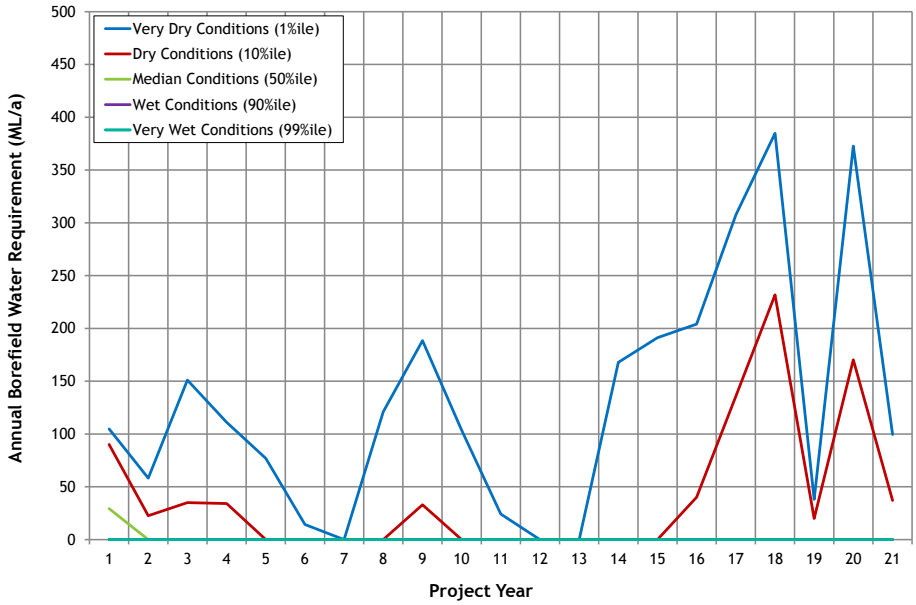

Figure 3.1 – Annual borefield water requirements

3.3 MINE WATER DAM STORAGE

The water management system is configured to pump excess water to a single dedicated Mine Water Dam (MWD) when capacity of the water management system is exceeded. This dam stores both excess groundwater from the underground operations, as well as decant return from the active TSF. The stored water is available for re-use as required. For this assessment, we have assumed the following for the MWD:

- The MWD is a turkey's nest storage (no external catchment area.
- As the dam surface area has an impact on the required capacity of MWD, a number of model iterations have been undertaken. The model results indicate that a MWD with a maximum surface area of 30.0 ha and a full supply volume of 1,400 ML is required.
- It is assumed that a dam (or multiple smaller dams) of this capacity could be located within the Project Disturbance Boundary.
- Water managed as part of the surface water management system is not stored in the underground mining operations. That is, water that is removed from the underground working is stored in surface infrastructure only.

Figure 3.2 shows the percentile plots of stored inventory in the MWD over the Project life. The results indicate that there is a:

- 1% chance of storing more than 1,350 ML in the MWD;
- 10% chance of storing more than 820 ML in the MWD;
- 50% chance of storing more than 330 ML in the MWD; and
- 90% chance of storing more than 120 ML in the MWD.

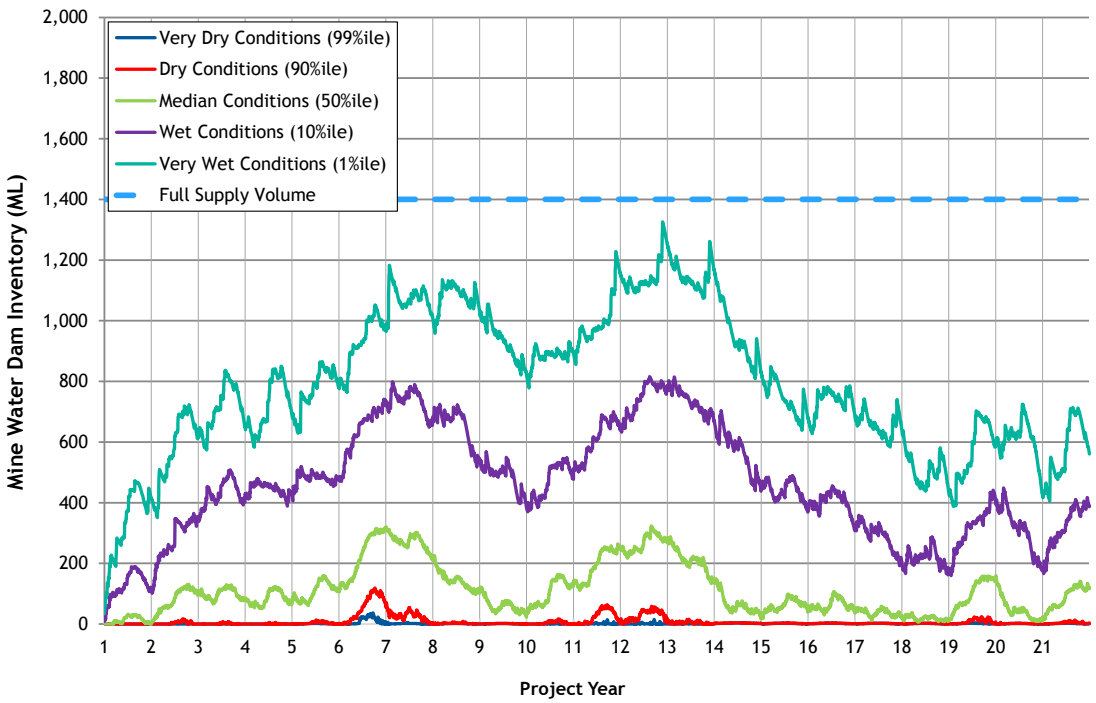

Figure 3.2 – Mine Water Dam stored inventory

The model results show that, to manage all water for the 1%ile very wet conditions, a MWD capacity of at least 1,350 ML would be required to contain excess mine water over the life of the Project.

Under some climatic conditions, the water balance modelling indicates that some excess mine water would remain at the end of the Project. The results show that there is a:

- 1% chance of having than 560 ML in the MWD at the end of the Project;
- 10% chance of having than 390 ML in the MWD at the end of the Project; and
- 50% chance of having than 120 ML in the MWD at the end of the Project

3.4 UNCONTROLLED OFFSITE RELEASES

The results of the site water balance modelling show that the site water management system can be operated to ensure with at least a 99% probability that no uncontrolled release of saline water over the Project life.

4 Commentary and discussion

4.1 GROUNDWATER

This assessment has utilised the groundwater inflows to the underground mining area as predicted as the base case within the EIS. Revision to the groundwater modelling has recently been undertaken by AGE, which greater inflows being predicted to occur into the underground mining area. Increasing the predicted groundwater inflows to the underground mining area will increase the volume of water required to be managed within the mine water management system, and the subsequent storage requirements to achieve zero discharge.

4.2 TAILINGS MOISTURE LOSS

The CHPP water balance has assumed that 50% of the moisture in the fine tailings waste stream is lost from the system through entrainment in the tailings matrix. This represents the moisture within the consolidated fine tailings that is not able to be decanted via the decant pond or evaporated from the surface of the tailings beach. Although this assumption is generally consistent with our experience at nearby mine sites, it can vary between operations.

A sensitivity analysis has been undertaken adopting a 40% tailings moisture loss. This results in a required dam capacity of around 2,650 ML (compared with 1,400 ML for the 50% moisture loss) for the 1% probability.

This shows that the water management system is very sensitive to the losses in the tailings facilities. With this in mind, the hypothetical underground only scenario raises some uncertainty relating whether the water management system could provide sufficient capacity to appropriately manage water to achieve zero discharge from the site.

Should the tailings moisture loss be less than 50%, then alternative water management measures would need to be considered (such as additional dam capacity, water treatment capabilities, and/or provision for controlled releases from the mine water system).

4.3 MINE WATER DAM AND ALTERNATIVE SOLUTIONS

Whilst a dam with a capacity of 1,400 ML is practically possible to construct, developing a dam of this size comes at a considerable cost and management liability. Depending on the adopted tailings moisture loss, the required capacity to manage water with the mine water management system may be significantly higher than this.

The primary aim of the mine water management system to contain all mine water may not be possible for the hypothetical underground only scenario in the absence of the open cut mining areas to assist with the management of surplus mine water during very wet periods as is proposed by the Project.

As a result, mine water may potentially need to be released to the receiving environment under the hypothetical underground only scenario. This could potentially be achieved through controlled mine water releases during receiving water flow events, the development of a Water Treatment Plant, or both. These alternate options have not been assessed for the hypothetical scenario as part of the current investigations.

5 References

WRM, 2015 *'Bylong Coal Project – Surface Water and Flooding Impact Assessment'*, Report prepared for Hansen Bailey Pty Ltd by WRM Water & Environment Pty Ltd, Report No. 0887-01-P3, 18 June 2015.

B

Response to Office of Environment and Heritage Submission

8 July 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to NSW OEH Submission, Dated 3 May 2016

1. INTRODUCTION

The '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367 for the Bylong Coal Project (the Project) was placed on public exhibition between 23 September and 6 November 2015.

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the EIS. The RTS included responses to the Office of Environment and Heritage (OEH) submission dated 6 November 2015 in relation to Aboriginal heritage and biodiversity matters.

During the period of preparing the RTS, a meeting was held with OEH in Dubbo on 3 February 2016 to clarify issues raised in its submission. As requested by OEH, Hansen Bailey provided revised vegetation mapping within the Project Disturbance Boundary on 12 February 2016. OEH reviewed the revised vegetation mapping and raised additional concerns in undated correspondence received on the 14 March 2016 (see **Appendix A**). With the RTS already largely completed, Hansen Bailey prepared a separate response to OEH's new issues in a letter dated 12 May 2016 which is also included in **Appendix A**. No further correspondence has been received from OEH over the matters addressed in this correspondence.

OEH has provided a further letter dated 3 May 2016 to the Department of Planning and Environment (DP&E) over different matters addressed in previous correspondence.

A meeting was held in Dubbo on 16 June 2016 to discuss issues raised within OEH's letter dated 3 May 2016 and to further discuss the issues raised in OEH's letter dated 14 March 2016. This letter has been prepared to respond to OEH's letter of the 3 May 2016 and subsequent discussions held during the meeting on 16 June 2016.

2. RESPONSE TO OEH SUBMISSION

2.1 ECOLOGY

Issue 1 - Introduction

OEH understands that the project is being assessed as a transitional project under the NSW Biodiversity Offsets Policy for Major Projects, and that the Proponent has committed to undertake a full biodiversity assessment using the Framework for Biodiversity Assessment (FBA).

As agreed, the Proponent has supplied the following additional biodiversity information with the Response to Submissions (RTS):

- *Biodiversity Assessment Report (BAR) following stages 1 and 2 of the FBA; and*
- *Biodiversity Offset Strategy (BOS) using indicative data which does not currently meet the requirements of stage 3 of the FBA.*

OEH considers that the additional information supplied with the RTS is sufficient to undertake an assessment at this stage of the process, but considers that the BOS will require further data to satisfy the requirements of the FBA at offset sites. The following comments have been made in this context.

Response

Noted.

Issue 2 – Offset Area 5

OEH has previously expressed concern regarding the appropriateness of Offset Areas 5 (OA5) as an offset property as the area will be subject to damage from surface cracking and subsidence caused by longwall mining directly under approximately 70 per cent of the proposed offset area. However, for the purposes of this RTS review, OEH is prepared to accept OA5 as part of the indicative BOS presented.

It is OEH's understanding that KEPCO is considering securing the offset sites through BioBanking Agreements but that the final mechanism will depend on negotiations with OEH and DP&E. BioBanking Agreements are OEH's preferred option for Offset Areas 1 to 4 and for the Yarran View offset site.

However, as noted in previous correspondence, including OEH's response to the EIS on 6 November 2015, Section 11(1) of the Threatened Species Conservation (Biodiversity Banking) Regulation 2008 (BioBanking Regulation) indicates that the land in OA5 is not suitable to be designated as a BioBank site as the area will be subject to future impact from underground mining. Therefore, the offsetting value of OA5 should be assessed after mining-related impacts have ceased, then secured through BioBanking if it delivers the credits required for this offset area. Prior to the cessation of mining impacts on OA5, the NSW Biodiversity Offsets Policy for Major Projects (Offsets Policy) indicates that a voluntary planning agreement under s93F of the EP&A Act may be a suitable mechanism to secure the offset. Alternatively a Trust Agreement under the Nature Conservation Trust Act 2001 may be a suitable mechanism. Further discussion on this matter between KEPCO, DP&E and OEH will be required.

<u>Recommendations</u>

2.1. DP&E accept OA5 as an offset option, secured under the Offsets Policy, subject to final FBA assessment after mining impacts have ceased. If mining impacts are greater than predicted, additional offsetting may be required.

2.2. KEPCO and DP&E continue to liaise with OEH to resolve a completed BOS including full data as required by the FBA for offset sites.

2.3. DP&E ensure that offset areas are secured under the provisions of the Offsets Policy.

Response

Recommendations 2.1 and 2.3 require actions from the DP&E. It is noted that the Project has been considered a Transitional Project and accordingly should be afforded a level of flexibility in relation to applying the provisions of the *NSW Biodiversity Offsets Policy for Major Projects* (Offset Policy for Major Projects). During the meeting with OEH and DP&E on 16 June 2016, DP&E indicated that they were accepting of offset area 5 as an offset property. Further, the formal mechanism for offsetting of Offset Area 5 was also discussed during this meeting.

Within recommendation 2.2, OEH has indicated that the Biodiversity Offset Strategy (BOS) prepared for the Project (Appendix K of the RTS) is incomplete and requires collection of additional survey data.

Following the commencement of the Offset Policy for Major Projects and associated Framework for Biodiversity Assessment (FBA) in October 2014, Cumberland Ecology sought advice from the OEH BioBanking Team (contacted via biobanking@environment.nsw.gov.au) on a number of matters. One of these matters related to the required content of the BOS for the environmental assessment stage.

Advice received from OEH in February 2015 included the following:

> *"The FBA requires that offset sites are assessed using the BBAM. However, there is no requirement for this detailed assessment to be undertaken when the BAR and BOS are submitted. In the BOS, the proponent only needs to identify a potential offset site/s that can be used to offset the development. As such, only limited information is required at the time of submitting the BOS as part of the EIS. Once the EIS has been reviewed and approved, and the impacts are defined, the proponent will need to secure and retire the number and type of credits required to offset the development."*

Based on this feedback, Cumberland Ecology prepared a BOS that utilised preliminary information collected from the proposed offset sites. Such information is considered to provide an indication of the biodiversity credits that may be generated from the offset sites. Until the quantum of impacts is agreed with OEH, as noted in its response to KEPCO in February 2015, it is considered unnecessary to undertake the full complement of surveys required under the BioBanking Assessment Methodology, as the size of offsets may change. OEH and DP&E confirmed during the meeting on 16 June 2016 that this approach remains acceptable and that the BOS including the full complement of surveys would be required as a post approval.

KEPCO propose to continue to liaise with DP&E and OEH to ensure that the correct number and type of credits are retired for the Project.

Issue 3 - Matters for Further Consideration

> *In a letter dated 2 March 2015, OEH supplied KEPCO with a list of species, populations and ecological communities which required further consideration if impacted by the Bylong Coal Project. The BAR has correctly identified encroachment on the riparian buffer along the Bylong River, Box Gum Woodland and derived native grassland, and the Regent Honeyeater as matters requiring further consideration by the consent authority under the FBA. Further information regarding these matters has been supplied in the BAR. One further species, the Brush-tailed Rock Wallaby, has been identified as having habitat present and was addressed as a species requiring an offset rather than as a matter for further consideration.*
>
> *No additional offsets, supplementary measures or other actions have yet been proposed within the BOS with respect to impacts on matters for further consideration.*

Recommendation

3.1. DP&E note that there are matters which will require further consideration by the consent authority as required under the FBA.

Response

Section 6.1 of the Biodiversity Assessment Report (BAR) (Appendix J of the RTS) noted that the Secretary's Environmental Assessment Requirements (SEARs) did not include a reference to the FBA, and therefore no matters for further consideration were identified.

The impact to a regionally significant biodiversity link (Bylong River) was assessed as a matter for further consideration within the BAR, due to the impacts meeting the criteria outlined within Table 4 of the FBA. On a precautionary basis, the BAR also assessed Box Gum Woodland and Derived Native Grassland and the Regent Honeyeater as matters for further consideration due to impacts to these entities. Additional information required in accordance with Section 9.2.2.2 of the FBA on these matters for further consideration is provided within Section 6.2 of the BAR.

The Brush-tailed Rock-wallaby was not considered as a matter for further consideration within the BAR. This is due to the Project only impacting a small area of habitat (outside of cliff line habitat) which is not considered to result in the extinction of the species from the subregion or significantly reduce the viability of the species.

Within the transitional implementation component on page 18 of the Offset Policy for Major Projects, the following is noted:

> *"The FBA further defines the impacts that require further consideration. It is recognised these definitions, particularly those relating to threatened species and ecological communities, currently involve quite blunt thresholds that may in some cases capture too many impacts (e.g. a critically endangered entity with broad distribution) and in other cases not capture all severe impacts that should undergo further consideration."*

Section 9.2.1.1 of the FBA outlines the requirements for matters for further consideration, which notes the following:

> *"Certain impacts on biodiversity values will require further consideration by the consent authority. These are impacts that are considered to be complicated or severe. A decision will be made by the consent authority on whether it is appropriate for these impacts to occur. The consent authority may determine:*
>
> *(a) the Major Project cannot be approved with that particular impact*
>
> *(b) modifications are required to the Major Project to reduce the severity of the impact*

> *(c) the Major Project can be approved but it will require additional offsets, supplementary measures or other actions to be undertaken with respect to that impact."*

In accordance with OEH's Recommendation 3.1, DP&E is required to consider the matters for further consideration identified for the Project.

Impacts to the regionally significant biodiversity link (Bylong River) identified as impacted by the Project are considered minimal. The Project Disturbance Boundary occupies 3.26 ha of the riparian buffer associated within the identified regionally significant biodiversity link, of which 0.85 ha comprises native vegetation (0.41 ha woodland and 0.45 ha grassland) and 2.40 ha comprised cleared land. As such, the impacts to this '*matter for further consideration*' are not considered to be '*complicated or severe*'.

Impacts to Box Gum Woodland and Derived Native Grassland are recognised as being of significance given the extent of clearing that has historically been undertaken within the range of the community. The Project will remove approximately 64 ha of woodland form and 142 ha of grassland form of this community. The impact to Box Gum Woodland and Derived Native Grassland is not considered to be '*complicated or severe*' and it is therefore considered adequate to provide the required ecosystem credits for this community, without the requirement for additional offsets.

Impacts to the Regent Honeyeater are recognised as being of significance given the critically endangered status of this species. However the impacts of the Project on this species are not considered to be '*complicated or severe*'. In recognition of the status of the species and its ability (or lack thereof) to respond to habitat improvements, the Regent Honeyeater has a high offset multiplier. As a result, any project assessed under the FBA that impacts habitat for this species is required to provide offsets at an 11:1 ratio. That is, for every 1 ha of habitat cleared, a total of 11 ha is required in an offset to meet the credit requirement of that impact. This offset requirement is higher than any of the vegetation communities impacted by the Project, including Box Gum Woodland and Derived Native Grassland. Given the high ratio of offsets required for this species, it is not considered necessary to provide additional offsets or supplementary measures for this species. Habitat for the Regent Honeyeater will be retained within the locality of the Project and will be connected to extensive areas of habitat within conservation reserves.

Given that the impacts to the three assessed matters for further consideration are not considered to be '*complicated or severe*', it is considered unnecessary for the Project to provide additional offsets, supplementary measures or other actions. The current offset areas provide the required ecosystem and species credits as calculated within the BAR for direct impacts within the Project Disturbance Boundary.

Issue 4 - Variation to Offset Rules – Ecosystem Credits

As detailed in the BOS (section 3.5.1) there is a shortfall of ecosystem credits (143 of 152 required) for one vegetation community, HU547 (Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion). The BOS proposes using another vegetation type, HU690 Grey Box - White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley which has approximately 6,000 surplus credits available. The FBA does not allow this substitution to occur under the variation rules, as HU547 is more highly cleared than HU690 (95 per cent cleared versus 90 per cent). OEH is willing to work with the Proponent to resolve this matter.

Recommendation

4.1. KEPCO and OEH further examine options for addressing the shortfall of ecosystem credits for the Fuzzy Box Woodland vegetation community.

Response

Section 3.5.1 of the BOS (Appendix K of the RTS) identified the shortfall of 143 HU547 (Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion) ecosystem credits and outlines the potential options for variation to the offset rules. The assessment determined that few options for varying the offset rules are available for HU547 and in some situations would provide biodiversity outcomes well beyond the locality of the Project that are targeted to non-related plant community types (PCTs) (such as Cumberland Plain Woodland within the Hawkesbury-Nepean bioregion or Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland within the Lachlan bioregion).

The BOS currently proposes to utilise excess credits of HU690 (Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley) that have been identified within the existing proposed offset areas.

Portions of the alternative PCT (HU690) within the offset areas are associated with Box Gum Woodland and Derived Native Grassland, a threatened ecological community (TEC) listed under both the *NSW Threatened Species Conservation Act 1995* (TSC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A number of the alternative PCTs for HU547 allowed under the variation rules are also associated with this TEC. Additionally, as outlined within Section 3.4.2 of the Ecological Impact Assessment (Appendix J of the EIS), the community is related to the Western Hunter Flats Fuzzy Box Woodland community mapped by OEH within the north-western portion of Wollemi National Park, which is considered to have affinities with the Box Gum Woodland and Derived Native Grassland TEC.

As discussed with OEH during the meeting on 16 June 2016, there are areas of vegetation conforming to the Fuzzy Box Woodland community located on KEPCO owned land, outside of the Project Boundary. Cumberland Ecology has identified a potential Fuzzy Box Woodland Offset Area as illustrated within the Figure provided in **Appendix B**. This area comprises approximately 2.35 ha of woodland and approximately 14.39 ha of grassland which conforms to the Fuzzy Box Woodland community. This is estimated to provide approximately 224 Fuzzy Box Woodland ecosystem credits which exceeds the shortfall of 143 ecosystem credits for HU547 (Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion) currently presented within the BOS.

It is also noted that KEPCO has sought to obtain HU547 ecosystem credits through a listing on the Credits Wanted Register. To date, no correspondence has been received regarding potential credits available for purchase.

As noted in OEH's recommendation 4.1, KEPCO will continue to engage with OEH in an endeavour to retire the required ecosystem credits for the Fuzzy Box Woodland community.

Issue 5 - Variation to Offset Rules – Species Credits

> *As detailed in the BOS section 3.5.2 there is a shortfall of species credits (81 of 13,174 required) for the Regent Honeyeater. Options for variation of offset rules under the FBA are constrained because the species is listed as critically endangered under both the EPBC Act and the TSC Act, and was identified as a "matter for further consideration" in the BAR following advice from OEH. OEH is willing to work with the Proponent to resolve this matter. As part of the assessment OEH may need to inspect habitat on the offset sites to confirm suitability for the Regent Honeyeater.*
>
> *<u>Recommendation</u>*
>
> *5.1. KEPCO and OEH further examine options for addressing the shortfall of species credits for the Regent Honeyeater.*

Response

Following the receipt of OEHs correspondence dated 3 May 2016, KEPCO was advised that the description of habitat for the Regent Honeyeater within the OEH Threatened Species Profile Database had been updated. The description previously referred to the recovery plan for the species. The Regent Honeyeater profile has subsequently been updated to *"As per veg type"* and provides a list of PCTs which are considered to comprise habitat for this species.

Amendment of habitat mapping based on the PCTs identified within the OEH Threatened Species Profile Database will result in alterations to the number of credits required for the Project Disturbance Boundary and the credits generated for the offset areas.

Table 1 summarises the revised number of credits required for the Project Disturbance Boundary and credits generated by the offset areas based on the extent of each of the PCTs (woody vegetation only) that have been designated as habitat within the OEH Threatened Species Profile Database. Based on the revised habitat mapping utilising the most contemporary PCTs identified in the latest version of the OEH Threatened Species Profile Database, calculations have shown that the offset areas will generate an excess of credits required for impacts to Regent Honeyeater habitat.

KEPCO will continue to liaise with OEH to ensure that there is agreement on the method utilised for mapping Regent Honeyeater habitat within the Project Disturbance Boundary and offset areas according to the latest OEH Threatened Species Profile Database.

Table 1
Regent Honeyeater Habitat Area and Credits Based on PCTs Identified within the OEH Threatened Species Profile Database

Item	Area (ha)	Credits	PCTs Assessed as Habitat
Impact			
Project Disturbance Boundary	184.12	14,177	HU690, HU714, HU732, HU824 (part), HU869
Impact Subtotal	**184.12**	**14,177**	
Offset Areas			
Offset Area 1	606.07	4,303	HU599, HU690, HU702, HU714, HU732, HU824 (part), HU869, HU886, HU891
Offset Area 2	199.13	1,414	HU690, HU702, HU714, HU824 (part), HU869, HU910
Offset Area 3	180.10	1,279	HU690, HU732, HU824 (part), HU869
Offset Area 4	34.36	244	HU690, HU714, HU732
Offset Area 5	946.69	6,721	HU690, HU702, HU714, HU732, HU824 (part), HU869, HU891, HU910
Yarran View Offset Area	258.62	1,836	HU690, HU702, HU714, HU824 (part), HU869
Offset Areas Subtotal	**2,225**	**15,797**	

Issue 5 – Cliffs

In the response to the EIS OEH recommended that Longwall 106 be shortened so that cliff C5 is not impacted by subsidence. Information supplied by KEPCO in the RTS confirms that the prominent cliffs (C5, C6, C8 and C9) will experience significant subsidence movement and likely cliff falls. In the RTS, KEPCO proposes to monitor subsidence information for the initial five longwalls and may modify the mine plan if the monitoring indicates that cliff C5 could be adversely impacted. KEPCO should be required to avoid impacts on cliff C5.

OEH also recommended insectivorous bat monitoring at prominent cliffs within and adjacent to the subsidence area to establish a baseline level of activity and search for potential roost sites. The RTS proposes to include monitoring within the Biodiversity Management Plan (BMP).

The EIS could not conclusively exclude the potential for breeding and/or roosting of these species in the cliff lines of the proposed subsidence area, and assumes their potential presence by including the known species in the BOS. The EIS states that additional impacts are likely to occur as a result of subsidence which may injure roosting bats, modify cave structures and impact on maternity roosting habitat, if present.

OEH remains concerned that subsidence may significantly affect the four prominent cliffs mentioned above, and some of the less prominent cliffs as shown in the RTS. Additionally some of these cliffs may harbour roosting sites for the threatened bats species discussed in the BAR. OEH recommended avoidance of cliff C5 as it is the longest and highest of those likely to be significantly impacted by subsidence and its position at the end of the longwall would minimise changes to the mine plan. Given that underground operations do not commence until year 7, and mining under the prominent cliffs will not occur until approximately year 14 there is sufficient time to undertake subsidence assessment and bat monitoring to address this issue. The onus should be on KEPCO to demonstrate that the cliffs likely to experience rock falls will not suffer significant damage and do not contain roost sites for threatened bats.

<u>Recommendations</u>

6.1. KEPCO is required to avoid impacts caused by subsidence on cliff C5.

6.2. A bat survey and monitoring program is included within the BMP to search for potential roost sites at prominent cliffs within and adjacent to the subsidence area and to establish a baseline for bat activity.

Response

Commitment nine in Section 6 (page 515) of the RTS, outlines KEPCO's commitment to minimise adverse subsidence impacts on Cliff 5 (C5) by potentially reducing the length of Longwall 106. This potential reduction in length of Longwall 106 will be based on monitoring data obtained during the mining of the initial five longwalls which will be used to verify and refine the subsidence model and confirm the arrangements to avoid any material impacts on C5. This will be detailed within the Subsidence and Extraction Plan for Longwall 106.

As noted in Section 4.11.5 of the RTS (page 163), whilst adverse impacts to cliffs not being directly undermined (such as C5) can be essentially avoided, there will remain the potential for low level far-field horizontal movements to occur to these protected features.

As referred to in the RTS, Section 5.4.3 of Appendix H of the EIS notes:

> "*The cliffs could also experience low level far-field horizontal movements of up to around 150 mm to 200 mm. These movements are expected to be bodily movements towards the extracted longwalls and are not expected to be associated with any significant strains. It is unlikely, therefore, that Cliffs 24278, 24279 and 24324 would be adversely impacted by the far-field horizontal movements, even if these predictions were exceeded by a factor of 2 times.*"

KEPCO have now committed to ensuring that any impacts upon C5 are managed in the same way as Cliffs 24278, 24279 and 24324. Therefore any material adverse impacts to C5 will be avoided.

Section 4.11.6 of the RTS notes the following in relation to monitoring of cave-dwelling bats:

> *"KEPCO will include provisions within the BMP to undertaken monitoring of cave-dwelling microbats within the Subsidence Study Area. Where access is possible, this will include monitoring of prominent cliffs identified within the EIS as being subject to significant subsidence movement (i.e. C5, C6, C8 and C9).*
>
> *Monitoring will be undertaken prior to commencement of the underground component of the Project to collect baseline information on the microbats utilising the Subsidence Study Area. Ongoing monitoring will be undertaken to determine if there are any observable impacts on the species known to occur. This will include assessment of changes in the occurrence of the Large-eared Pied Bat (Chalinolobus dwyeri) and Eastern Bentwing-bat (Miniopterus schreibersii oceanensis), both of which are known to occur within the Subsidence Study Area."*

Additional to the above, significant subsidence movements to C5 will now be avoided.

As recommended by OEH, KEPCO will include provisions within the Biodiversity Management Plan (BMP) to undertake searches of potential roost sites at prominent cliffs within and adjacent to the Subsidence Study Area (C5, C6, C8 and C9) in conjunction with the above mentioned monitoring of cave-dwelling microbats.

2.2 ADDITIONAL ITEMS RAISED DURING MEETING

Issue 1 – Category 2 and Category 3 Grassland Mapping

> *During a meeting on 16 June 2016, discussion took place in relation to OEH's letter dated 14 March 2016 and KEPCO's response to this letter dated 12 May 2016. DoE has requested the inclusion of areas of grassland conforming to Category 2 and Category 3 grasslands within the mapped extent of Box Gum Woodland and Derived Native Grassland within the Project Disturbance Boundary.*

Response

Cumberland Ecology has prepared the Figure provided within **Appendix C** to show the extent of EPBC Act listed Box Gum Woodland and Derived Native Grassland as mapped in the RTS as well as the additional areas requested for inclusion by DoE. Category 2 and Category 3 grasslands were not considered in the EIS and RTS as conforming to the EPBC Act listing of Box Gum Woodland and Derived Native Grassland due to low native plant species diversity and often high cover of exotic plants (e.g. 50% cover). This is reflected by the low site value score for these two categories of grassland under the FBA. Further justification for the exclusion of these areas of grassland from the EPBC Act listing is provided in correspondence from Hansen Bailey to OEH on 2 May 2016 (see **Appendix A**) prepared in response to queries regarding the extent of mapping of Box Gum Woodland and Derived Native Grassland.

The revised mapping of the EPBC Act Box Gum Woodland and Derived Native Grassland community reflecting DoE's request illustrates approximately 68 ha of Category 2 grasslands and 43 ha of Category 3 grasslands. This results in the total mapped EPBC Act Box Gum Woodland and Derived Native Grassland community reflecting DoE's request within the Project Disturbance Boundary to be approximately 249 ha. This is approximately 111 ha additional EPBC Act Box Gum Woodland and Derived Native Grassland to that identified within the RTS.

2.3 ABORIGINAL HERITAGE

Issue 1 - Mitigation Strategies

> *The OEH submission to DP&E raised 9 issues about the Bylong Coal ACH study (6 November 2015) and these issues were reiterated with DP&E and KEPCO at a follow up meeting (3 February 2016).*
>
> *OEH is satisfied with the responses by KEPCO for most of the issues previously raised. Two key issues remain.*
>
> *1. The response to the issues about the ochre site OQ001 is incomplete, and all of the rock art specialist recommendations (Gunn 2016) should be acted upon.*
>
> *2. OEH do not accept the response by KEPCO that accumulative harm to Aboriginal Heritage will be minimal from the proposed mine development.*
>
> *OEH do accept the proposed KEPCO mitigation strategies overall which, are yet to be finalised through the development of the Heritage Management Plan to be inclusive of input from the Registered Aboriginal Parties (RAPs).*

Response

Noted. Remaining issues are responded to below.

Issue 2 - Aboriginal Ochre Site OQ001 – Gender Importance

OEH acknowledges that a rock art specialist has re-examined site OQ001 to guide management decisions for the site (Gunn, 2016).

In considering the KEPCO response OEH has also reviewed and considered the findings of Gunn (2016). Key findings of the OEH examination are as follow:

- *There is no physical evidence to support the earlier claim by RPS (2015) that it is an archaeological site; and*
- *The claim by RPS, based on advice from a member of the Registered Aboriginal Party, that the site is of gender importance lacks documentation and therefore requires supporting documentation to understand the site's contemporary claim of significance.*

Response

Point 1 is noted. As noted in Section 4.11.15 of the RTS, the analysis of the ochre site by RPS (2015) is superseded by information contained in the Gunn (2016) report.

In reference to point 2, the information given by Registered Aboriginal Party (RAP) representatives was based on the use of OQ001 as a quarry (which has subsequently been assessed to not be the case due to the lack of available evidence of quarrying). Geological feature OQ001 is primarily comprised a band of red pigment; however, some of this graded into a magenta/purple pigment. The geological feature also contained a band of yellow pigment.

Arthur Fletcher (Wonn 1 Contracting), who is a RAP for the Project indicated to RPS that different colours of ochre were used by different genders, whereby red ochre was used primarily by men and that yellow and purple ochre used by women. No other RAP representatives verified that this was their understanding of the use of ochre colours. Rock art in the region appears to primarily utilise red ochre.

RPS considers that this information provided by Arthur Fletcher is only relevant in the context that the OQ001 is a quarry and was utilised by Aboriginal people. Accounting for the recent findings by Gunn (2016) which identified that this area lacked the features of an archaeological site and has no evidence of usage by Aboriginal people; RPS do not consider this geological feature to have a specific gender importance.

Issue 3 - Aboriginal Ochre Site OQ001 – Gunn Additional Findings

OEH review of the Gunn (2016) assessment recognises additional findings which are not in the KEPCO response:

- *The exposed seam at OQ001 consists of good quality red and yellow mineral substances suitable for the preparation of ochre.*

- *Gunn (2016) hypothesises that the exposed seam is potentially extensive across the region and that a chemical analysis would be necessary to determine if this was the case.*

Response

Noted. Refer to response in **Issue 5**.

Issue 4 - Aboriginal Ochre Site OQ001 – AHIMS Examination

In addition to the study by Gunn (2016), OEH has undertaken an examination of records of known art sites for the region from the Aboriginal Heritage Information Management System (AHIMS).

Those records show that Aboriginal choice of ochre for rock art work is red despite reports of natural outcrops of yellow and white mineral deposits. This phenomena has not been previously realised and reasons for ochre preference may be either cultural or environmental. The Gunn (2016) recommendation for chemical analysis has considerable merit and should therefore be considered.

OEH has also discovered through examining the AHIMS database that the region's rock art sites comprise mostly of hand stencils (c.95 per cent) with few examples of other subjects for example, animals and tracks. The frequency of hand stencils per rock shelter is relatively low on average but are numerously placed across the region based on studies of nearby coal mine assessments including the Bylong assessment. The key findings by Gunn (2016), in addition to art site patterns identified on AHIMS, warrants further investigation to understand the dominance of red ochre and hand stencilled art across the region.

Response

The information provided by OEH is noted. Refer to response in **Issue 5**.

Issue 5 - Aboriginal Ochre Site OQ001 – Adequate Documentation

OEH agree with the general statement by Gunn (2016) about the high cultural significance of ochre quarries and/or sources to Aboriginal people as reported by various researchers across the continent (Gunn 2016:3). OEH support the Gunn (2016) recommendation that adequate documentation about the cultural importance of the site is presented.

OEH acknowledge that KEPCO will address the findings of the specialist study with the Registered Aboriginal Parties during consultation with the RAPs.

Response

KEPCO proposes to undertake a specialist study which takes into account all of the recommendations presented in Gunn (2016). This specialist study will address the recommendation to undertake a chemical analysis of the pigment and identifying its availability across the region as geological strata. It will also examine the known rock art sites in the region and assess the possible environmental or cultural reasons for the use of red ochre and the prevalence of hand stencil motifs over other motifs.

This specialist study will be undertaken in the post-approval stage of the Project during the preparation of the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP) for the Project.

Issue 6 - Archaeological Context and Accumulative Harm to Aboriginal Sites

> *KEPCO maintain that harm to ACH sites within the Bylong Coal easement overall will be minimal. KEPCO has also provided an archaeological summary of the several hundred Aboriginal sites discovered during the previous Ulan, Wilpinjong and Moolarben mine investigations. The vast majority of those objects have since been removed through various mitigation activities. Collectively, the sites affected by the proposed Bylong Coal project will increase harm to ACH regionally.*
>
> *The environmental impact assessment should draw on the results of studies from the vicinity because they are in many instances the only source of detailed information that can provide the context and baseline of what is known about Aboriginal cultural heritage. This point is stated in the "OEH Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011:6)".*

Response

It is noted that OEH does not have set guidelines for assessing cumulative impacts for Aboriginal heritage. Accordingly, RPS considers it is unreasonable for OEH to expect a uniform methodology to be applied for cumulative impact assessment. As such, the cumulative impacts identified by OEH and that submitted by KEPCO are different on methodological grounds.

Notwithstanding, KEPCO has provided a more detailed regional analysis of the Aboriginal sites identified at Ulan, Wilpinjong and Moolarben mine within the RTS which has provided context and a base line of what is known about Aboriginal cultural heritage in the region. This assessment therefore complies with the requirements of *Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011:6).

It is noted that this regional analysis considers the impacts anticipated within the footprint of these mining developments which represents only a small proportion of region being analysed.

The Figure within **Appendix D** has been developed to provide a visual representation of the known Aboriginal heritage sites listed on the AHIMS database across the region and association with particular developments. Within the region being analysed, there are vast areas of land (including National Parks and Nature Reserves) which have not been subject to detailed Aboriginal Archaeological assessments (in the same level of detail as the mining sites). It is therefore likely that these areas which have not been subject of detailed surveys would contain similar densities of Aboriginal heritage sites as those which have been surveyed.

Despite the differences between the cumulative impact assessment approaches, KEPCO has committed to adhering to the recommendations from OEH to offset the cumulative impact (as assessed by OEH) and as such provide a balance to the impact with a suitable conservation gain (further discussed in **Issue 8**).

Issue 7 - Archaeological Significance Assessment (Scientific)

> *OEH remain uncertain about the assessment of scientific significance of artefact scatters within the proposed project footprint. KEPCO have responded to this issue by stating that:*
>
> *"Due to the smaller size of artefact scatters at the {Bylong} Project compared with the former Mt Penny Project, detailed site content analysis was not deemed warranted."*
>
> *OEH therefore cannot advise DP&E on the documented significance of the artefact assemblages discovered within the Bylong mine easement (RPS 2015) and will await the results of the mitigation and excavations proposed by KEPCO during the Heritage Management Plan process. OEH do accept the KEPCO response to the previous OEH recommendation to re-evaluate the proposed RPS excavation program which will now have greater focus at suitable localities along the Bylong valley floor.*
>
> *OEH accept the response from KEPCO on issues raised by OEH of Aboriginal cultural significance but emphasise that further work will be needed in assessing and documenting cultural significance during the Heritage Management Plan process as also recommended by Gunn (2016).*

Response

Noted.

Issue 8 - Aboriginal Heritage – Regional Impacts

OEH remains concerned about the threshold of harm that is now encroaching on ACH generally from expanding mine interest in the region. Notwithstanding the mitigation actions of previous mine projects and those of the proposed Bylong Coal project, OEH is concerned that harm to ACH is approaching unacceptable thresholds for the region unless adequately balanced with a measured conservation gain. An imbalance of this scale may have permanent intergenerational consequences.

Recommendations

1. ACH assessments of select biodiversity offset areas for the Bylong Coal project.

2. A regional rock art study that includes all recommendations of the Gunn assessment report (Gunn 2016) and that provides opportunities for Aboriginal people to develop informed views on contemporary cultural significance.

Response

As explained in the response to **Issue 6**, there are vast areas of land covered by National Parks and Nature Reserves which will likely contain Aboriginal heritage values of the region being analysed. OEH's concern over the thresholds of harm being encroached is based on data from areas assessed in relation to mining development and does not consider the regional context.

Despite this, KEPCO agrees with OEH's recommendations and will prepare the methodologies for both these assessments in accordance with OEH guidelines and advice. The specialist rock art study (**Issue 5**) and the assessments of select Biodiversity Offset Areas for the Project will be undertaken as a component of the AACHMP in consultation with OEH and the RAPs.

3. CONCLUSION

We trust this response addresses the issues raised in the NSW OEH submission. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

APPENDIX A

OEH CORRESPONDENCE (14 MARCH 2016) AND KEPCO RESPONSE (12 MAY 2016)

DOC16/114189-1

Mr Nathan Cooper
Senior Environmental Scientist
Hansen Bailey
ncooper@hansenbailey.com.au

Dear Nathan

Bylong Coal - Updated Vegetation Mapping and Box Gum Woodland

Thank you for your email of 12 February 2016 which included updates to mapping of vegetation within the Bylong Coal Project Area by Cumberland Ecology. This update focussed on areas of grassy woodlands and resulted in the total area of mapped woody vegetation within the Project Disturbance Boundary increasing by approximately 3.4 hectares. The Office of Environment and Heritage (OEH) has reviewed this mapping and provides comment in Attachment A.

As you are aware, the Commonwealth Department of the Environment (DoE) has declared the project to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* and it is to be assessed as a transitional project under the Bilateral Agreement between the Commonwealth of Australia and the State of New South Wales. In conjunction with reviewing the mapping and consulting with DoE regarding identification of threatened Box Gum Woodland, OEH has become aware that the amount of threatened woodland present within the Project Area has been underestimated in the Environmental Impact Statement. This needs to be rectified in the Biodiversity Assessment Report for inclusion within the Response to Submissions. Further detail is provided in Attachment A.

If you have any questions regarding this matter please contact Terry Mazzer on 02 6883 5302 or email terry.mazzer@environment.nsw.gov.au.

Yours sincerely

PETER CHRISTIE
Regional Manager, North West
Regional Operations

cc: Stephen O'Donoghue DP&E
Attachment A: OEH Review - Updated Vegetation Mapping and Box Gum Woodland

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ATTACHMENT A

OEH Review - Updated Vegetation Mapping and Box Gum Woodland Bylong Coal Project

Acronyms

CEEC	Critically Endangered Ecological Community
DNG	Derived Native Grassland
DP&E	Department of Planning and Environment
EIS	Environmental Impact Statement
EEC	Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
OEH	Office of Environment and Heritage
TSC Act	*Threatened Species Conservation Act 1995*

1. Vegetation Mapping

In our submission on the EIS, OEH expressed concern regarding the delineation between woody vegetation types and derived native grassland (DNG). As a result of the meeting between the Proponent, DP&E and OEH in Dubbo on 3 February 2016, Cumberland Ecology have reviewed the mapping following the principles that patches of grassy woodlands are included in the updated mapping if:

- they comprise 5 or more trees (from the same vegetation community) and
- each tree is located no more than 75 m from another tree (from the same vegetation community).

This has resulted in an additional 3.4 ha of woodland vegetation identified within the Project Disturbance Boundary and a similar reduction in DNG and cleared land. The updated mapping does not address all of OEH's concerns regarding vegetation mapping at the Project Area. However, OEH is prepared to accept the mapping in this case as this project is a transitional project under the Bilateral Agreement with the Commonwealth, there are no approved guidelines regarding mapping of vegetation at fine scales and mapping to a different standard would make relatively little difference in this situation.

Recommendation

1.1. Use the updated mapping of vegetation communities within the Project Disturbance Boundary to calculate the quantum of ecosystem and species credits required to be offset under the FBA.

2. Box Gum Woodland

The EIS identifies the presence of White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland within the study area, including within the Project Disturbance Boundary. This community, generally referred to as Box Gum Woodland, is listed as an EEC under the TSC Act and a CEEC under the EPBC Act. Three woodland types are identified in the EIS which conform to the Box Gum Woodland listing: Yellow Box Woodland, White Box Grassy Woodland and Blakely's Red Gum Woodland (Grassy). Each of these also has associated DNG within the study area.

Section 3.2.23 of Appendix J of the EIS provides a description of the DNG within the study area, including within the Project Disturbance Boundary. In this section DNG is divided into three classes:

1. TSC Act and EPBC Act DNG. These support more than twelve native non-grass species plus at least one 'important' species. Mapping codes are 6(1), 7(1) and 8(1), although no 8(1) has been mapped within the Project Disturbance Boundary. Hereon denoted as "no 1 DNG".

2. TSC Act only DNG. These support less than twelve native non-grass species. Mapping codes are 6(2), 7(2) and 8(2), although no 8(2) has been mapped within the Project Disturbance Boundary. Hereon denoted as "no 2 DNG".

3. Non-listed DNG. Box Gum DNG mapping codes are 6(3) and 7(3). Hereon denoted as "no 3 DNG". Other non-listed DNG types also occur; Slaty Box DNG (9), Coastal Grey Box DNG (10) and Fuzzy Box DNG (11).

OEH agrees that the "no 1 DNG" types have the characteristics necessary for them to conform to the TSC Act and EPBC Act listing criteria. OEH also agrees that the "no 2 DNG" types conform to the TSC Act listing but advice from DoE officers indicates that they also conform to the EPBC Act listing. OEH considers that the "no 3 DNG" types conform to the TSC Act and, also on DoE advice, EPBC Act listing criteria.

EPBC Act Criteria.

EPBC Act Policy Statement "*White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands*[1]" defines a patch of Box Gum Grassy Woodland CEEC as "*a continuous area containing the ecological community…the larger of:*

- *an area that covers five or more trees in which no tree is greater than 75 m from another tree, or*
- *the area over which the understorey is predominantly native.*"

The EIS, and subsequent additional data, indicates that all areas mapped as DNG are native vegetation with a predominantly native understorey. Within the Project Disturbance Boundary mapped areas of White Box Woodland, Yellow Box Woodland and "no 1 DNG" are correctly identified as conforming to the EPBC Act listing. However, all areas of "no 2 DNG" and "no 3 DNG" are connected with areas of Box Gum Grassy Woodland or "no 1 DNG". From the definition above and guidance from DoE officers, all areas of DNG form a continuous patch of Box Gum Grassy Woodland CEEC. Consequently the extent of CEEC listed under the EPBC Act is approximately 249 ha, not the 138 ha identified in the updated vegetation mapping (135 ha in EIS).

TSC Act Criteria.

1. In paragraph six of the final determination of White Box Yellow Box Blakely's Red Gum Woodland the NSW Scientific Committee states that the NSW determination includes "*Grassy white box woodland of the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999*"[2]. Consequently the area of EPBC Act outlined above must be considered as conforming to the TSC Act definition as EEC.

2. The EIS stated that "*Areas of low quality grassland were considered to conform to the TSC Act listing within an approximate 50 m buffer from woodland patches or scattered trees*" (Bylong Coal EIS Appendix J, p 2.10). This indicates that areas outside this 50 m buffer were not considered to be EEC. Examination of the vegetation mapping supplied shows that areas of "no 3 DNG" do indeed occur outside this buffer.

   An explanation of the derivation of the buffer is found within Appendix B of Appendix J of the final EIS (p 56-57). This states that "*Other areas of grassland with little or no remnant paddock trees have been determined as low condition of Derived Native Grasslands, based on previous experiences of Cumberland Ecology for projects in similar landscapes elsewhere. They consider that areas within ~50m of remnant trees would most likely show reasonable recovery if allowed, while outside of 50m recovery would be difficult. Grasslands outside of this 50m buffer within the proposed direct impact area have therefore been annotated as low*

[1] http://www.environment.gov.au/system/files/resources/be2ff840-7e59-48b0-9eb5-4ad003d01481/files/box-gum.pdf
[2] http://www.environment.nsw.gov.au/determinations/BoxgumWoodlandEndComListing.htm

condition Derived Native Grassland." OEH does not consider that the use of an arbitrary buffer is a valid reason for excluding areas of DNG from the TSC Act listing.

The NSW Identification Guidelines for Endangered Ecological Communities: White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) (NPWS 2004[3]) state that:

"The definition of the Box-Gum Woodland explicitly recognises that some remnants are degraded. Highly disturbed sites that have few if any native species in the understorey are specifically included in the community provided vegetation, either understorey or overstorey or both, would, under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact.

Determining whether the vegetation will respond to assisted natural regeneration will often be highly problematic. Sites where there is unlikely to be sufficient seed remaining in the soil for the understorey or overstorey to regenerate are not part of the EEC".

The quadrat data supplied by the Proponent in the areas of "no 3 DNG" does not support the contention that these sites will not respond to assisted natural regeneration nor that there is unlikely to be sufficient seed remaining in the soil for the understorey or the overstorey to regenerate.

For the two reasons detailed above, OEH is of the opinion that the extent of EEC listed under the TSC Act is approximately 251 ha, not the 208 ha identified in the updated vegetation mapping (206 ha in EIS).

<u>Recommendation</u>

2.1. Use the corrected designation of DNG types as EEC within the Project Disturbance Boundary to calculate the quantum of ecosystem and species credits required to be offset under the FBA.

[3] http://www.environment.nsw.gov.au/resources/nature/box-gumIdGuidelines.pdf

12 May 2016

Regional Manager, North West
Regional Operations
Office of Environment and Heritage
PO Box 2111
DUBBO NSW 2830

Attention: Mr Peter Christie

Dear Peter,

Bylong Coal Project EIS
Response to OEH Review Letter – Updated Vegetation Mapping and Box Gum Woodland

1. INTRODUCTION

In response to the Office of Environment and Heritage (OEH) submission on the Bylong Coal Project Environmental Impact Statement dated 6 November 2015 (Bylong EIS), and discussions during a meeting in Dubbo on 3 February 2016, Hansen Bailey provided OEH with updates to mapping of vegetation within the Bylong Coal Project Area on 12 February 2016. Consistent with the discussions on 3 February 2016, this update in vegetation mapping focussed on the buffer area included around areas of grassy woodland communities. The updated vegetation mapping resulted in the total area of mapped woody vegetation within the Project Disturbance Boundary increasing by approximately 3.4 hectares (ha).

Hansen Bailey subsequently prepared the document '*Bylong Coal Project Response to Submissions*' dated 23 March 2016 (Bylong RTS) to address comments received during the public exhibition of the Bylong EIS, including those from OEH. The Bylong RTS included a revised Biodiversity Assessment Report (BAR) and Biodiversity Offset Strategy (BOS) as Appendices J and K of the Bylong RTS, respectively.

OEH reviewed the revised vegetation mapping and raised additional concerns in undated correspondence received on the 14 March 2016 that "…*the amount of threatened woodland present within the Project Area has been underestimated in the Environmental Impact Statement. This needs to be rectified in the Biodiversity Assessment Report for inclusion within the Response to Submissions."* The OEH correspondence also contains two recommendations.

The Bylong RTS document (including revised BAR and BOS) was in the process of being finalised prior to the latest correspondence being received from OEH regarding the revised vegetation mapping. Responses to the recommendations from the OEH correspondence are therefore addressed separately within this letter.

2. RESPONSE TO OEH QUERIES

2.1 VEGETATION MAPPING

2.1.1 Issue

In our submission on the EIS, OEH expressed concern regarding the delineation between woody vegetation types and derived native grassland (DNG). As a result of the meeting between the Proponent, DP&E and OEH in Dubbo on 3 February 2016, Cumberland Ecology have reviewed the mapping …resulted in an additional 3.4 ha of woodland vegetation identified within the Project Disturbance Boundary and a similar reduction in DNG and cleared land."

Recommendation

1.1. Use the updated mapping of vegetation communities within the Project Disturbance Boundary to calculate the quantum of ecosystem and species credits required to be offset under the FBA.

2.1.2 Response

As recommended by OEH, the updated mapping of vegetation communities within the Project Disturbance Boundary has been used to calculate the quantum of ecosystem and species credits required to be offset for the Project under the *Framework for Biodiversity Assessment* (FBA) and *NSW Biodiversity Offsets Policy for Major Projects* (Offsets Policy). The revised vegetation mapping, and the methodology within the FBA and Offsets Policy have been relied upon in the preparation of the BAR and BOS documents which are included as Appendices J and K of the Bylong RTS.

2.2 MAPPING OF LISTED BOX GUM WOODLAND

2.2.1 Issue

The EIS identifies the presence of White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland within the study area, including within the Project Disturbance Boundary. This community, generally referred to as Box Gum Woodland, is listed as an EEC under the TSC Act and a CEEC under the EPBC Act. Three woodland types are identified in the EIS which conform to the Box Gum Woodland listing: Yellow Box Woodland, White Box Grassy Woodland and Blakely's Red Gum Woodland (Grassy). Each of these also has associated DNG within the study area.

Section 3.2.23 of Appendix J of the EIS provides a description of the DNG within the study area, including within the Project Disturbance Boundary. In this section DNG is divided into three classes:

1. TSC Act and EPBC Act DNG. These support more than twelve native non-grass species plus at least one 'important' species. Mapping codes are 6(1), 7(1) and 8(1), although no 8(1) has been mapped within the Project Disturbance Boundary. Hereon denoted as "no 1 DNG".

2. TSC Act only DNG. These support less than twelve native non-grass species. Mapping codes are 6(2), 7(2) and 8(2), although no 8(2) has been mapped within the Project Disturbance Boundary. Hereon denoted as "no 2 DNG".

3. Non-listed DNG. Box Gum DNG mapping codes are 6(3) and 7(3). Hereon denoted as "no 3 DNG". Other non-listed DNG types also occur; Slaty Box DNG (9), Coastal Grey Box DNG (10) and Fuzzy Box DNG (11).

OEH agrees that the "no 1 DNG" types have the characteristics necessary for them to conform to the TSC Act and EPBC Act listing criteria. OEH also agrees that the "no 2 DNG" types conform to the TSC Act listing but advice from DoE officers indicates that they also conform to the EPBC Act listing. OEH considers that the "no 3 DNG" types conform to the TSC Act and, also on DoE advice, EPBC Act listing criteria.

EPBC Act Criteria

EPBC Act Policy Statement "White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands1" defines a patch of Box Gum Grassy Woodland CEEC as "a continuous area containing the ecological community…the larger of:

- *an area that covers five or more trees in which no tree is greater than 75 m from another tree, or*
- *the area over which the understorey is predominantly native."*

The EIS, and subsequent additional data, indicates that all areas mapped as DNG are native vegetation with a predominantly native understorey. Within the Project Disturbance Boundary mapped areas of White Box Woodland, Yellow Box Woodland and "no 1 DNG" are correctly identified as conforming to the EPBC Act listing. However, all areas of "no 2 DNG" and "no 3 DNG" are connected with areas of Box Gum Grassy Woodland or "no 1 DNG". From the definition above and guidance from DoE officers, all areas of DNG form a continuous patch of Box Gum Grassy Woodland CEEC. Consequently the extent of CEEC listed under the EPBC Act is approximately 249 ha, not the 138 ha identified in the updated vegetation mapping (135 ha in EIS).

TSC Act Criteria

1. In paragraph six of the final determination of White Box Yellow Box Blakely's Red Gum Woodland the NSW Scientific Committee states that the NSW determination includes "Grassy white box woodland of the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999"2. Consequently the area of EPBC Act outlined above must be considered as conforming to the TSC Act definition as EEC.

2. The EIS stated that "Areas of low quality grassland were considered to conform to the TSC Act listing within an approximate 50 m buffer from woodland patches or scattered trees" (Bylong Coal EIS Appendix J, p 2.10). This indicates that areas outside this 50 m buffer were not considered to be EEC. Examination of the vegetation mapping supplied shows that areas of "no 3 DNG" do indeed occur outside this buffer.

An explanation of the derivation of the buffer is found within Appendix B of Appendix J of the final EIS (p 56-57). This states that "Other areas of grassland with little or no remnant paddock trees have been determined as low condition of Derived Native Grasslands, based on previous experiences of Cumberland Ecology for projects in similar landscapes elsewhere. They consider that areas within ~50m of remnant trees would most likely show reasonable recovery if allowed, while outside of 50m recovery would be difficult. Grasslands outside of this 50m buffer within the proposed direct impact area have therefore been annotated as low condition Derived Native Grassland." OEH does not consider that the use of an arbitrary buffer is a valid reason for excluding areas of DNG from the TSC Act listing.

The NSW Identification Guidelines for Endangered Ecological Communities: White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) (NPWS 20043) state that:

> *"The definition of the Box-Gum Woodland explicitly recognises that some remnants are degraded. Highly disturbed sites that have few if any native species in the understorey are specifically included in the community provided vegetation, either understorey or overstorey or both, would, under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact.*

Determining whether the vegetation will respond to assisted natural regeneration will often be highly problematic. Sites where there is unlikely to be sufficient seed remaining in the soil for the understorey or overstorey to regenerate are not part of the EEC".

The quadrat data supplied by the Proponent in the areas of "no 3 DNG" does not support the contention that these sites will not respond to assisted natural regeneration nor that there is unlikely to be sufficient seed remaining in the soil for the understorey or the overstorey to regenerate.

For the two reasons detailed above, OEH is of the opinion that the extent of EEC listed under the TSC Act is approximately 251 ha, not the 208 ha identified in the updated vegetation mapping (206 ha in EIS).

Recommendation

2.1. Use the corrected designation of DNG types as EEC within the Project Disturbance Boundary to calculate the quantum of ecosystem and species credits required to be offset under the FBA.

2.2.2 Response

OEH's letter refers to the *Environment Protection and Biodiversity Conservation Act (EPBC Act) Policy Statement 3.5* to confirm how a patch of the listed community is defined. Based on the interpretation of this policy statement presented within your letter, areas of Category 2 and Category 3 grasslands should also be included within the listed community as they are connected to areas of Category 1 grasslands and *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grasslands* (Box Gum Woodlands).

We question this approach for the following reasons:

- This approach does not consider the description of condition states contained within the *EPBC Act Box Gum Woodland Listing Advice* (listing advice); and
- It does not align with recent precedents in the assessment of State Significant Development projects.

Listing advice

The approach presented within OEH's letter does not consider other sections of the listing advice, which provide further discussion regarding the condition of the vegetation community for it to be classified as the listed community. The following three condition states are described within the listing advice:

A) An overstorey of eucalypt trees exists, but there is no substantial native understorey;
B) A native understorey exists, but the trees have been cleared; and
C) Both a native understorey and an overstorey of eucalypts exist in conjunction.

Condition State A is not listed under the EPBC Act. This is regardless of whether the patch is continuous with other patches of the community.

The listing advice then goes on to say:

> "*The size and life-form of understorey species are such that viable populations can exist in very small areas (Prober & Thiele 1993). Therefore, in order to be the listed ecological community, an understorey patch, in the absence of overstorey trees, must have a high level of native floral species diversity, but only needs to be 0.1 hectares or greater in size. A patch in which the perennial vegetation of the ground layer is dominated by native species, and which contains at least 12 native, non-grass understorey species (such as forbs, shrubs, ferns, grasses and sedges) is considered to have a sufficiently high level of native diversity to be the listed ecological community. At least one of the understorey species should be an important species (e.g. grazing-sensitive, regionally significant or uncommon species; such as Kangaroo Grass or orchids) in order to indicate a reasonable condition.*"

The above has been interpreted as allowing the assessment of an understorey patch (State B) differently to an overstorey patch (State C).

The definition of State C within the listing advice uses the term "*in conjunction*", which is interpreted as co-occurring, rather than a mixed patch of grassland and woodland. The listing advice discusses State C as follows:

> "*Areas with both an overstorey and understorey present are also considered of sufficiently good condition to be part of the listed ecological community if the understorey meets any of the conditions above, or if they have a predominantly native understorey, are two hectares or above in size, and have either natural regeneration of the overstorey species or 20 or more mature trees per hectare*".

If State C is interpreted as a patch containing a combination of woodland and grassland areas, a very small area of woodland could exist that has 12 native non-grass understorey species adjacent to an expansive area of low diversity native grassland (<12 native species) and it would all qualify as the listed community. Advice from the Project's ecologists is that this is an unreasonable and an unintentional interpretation given that the listing advice indicates that to be included within the listed community, the areas would need to be of sufficiently good condition.

Based on the listing advice, Category 2 and Category 3 grasslands are not of high enough quality to meet the definition of State B and therefore do not comprise the listed community.

Recent approvals

Examples of recent approvals where the definition outlined within OEH's letter has not been applied include the Maules Creek Coal Project and the Watermark Coal Project. Taking the Watermark Coal Project as an example, extensive areas of low diversity native grassland were mapped adjacent to both intact and fragmented remnants of Box Gum Woodland and patches of higher quality Derived Native Grassland. However, the Commonwealth Department of the Environment (DoE) did not require the areas of low diversity native grassland to be assessed as conforming to the derived native grassland component of the listed community. Additionally, DoE raised concerns regarding the proposed revegetation of low diversity native grassland in the offsets due to the historical agricultural use of the land which may potentially make them unsuitable for full ecological community re-creation.

TSC Act Criteria

OEH refer to the *Threatened Species Conservation Act 1995* (TSC Act) final determination for Box Gum Woodland and Derived Native Grassland (final determination) as to how the TSC Act listed community is defined. Based on the interpretation of the final determination presented within OEH's letter, areas of Category 3 grasslands should be included within the listed community as they would also (in accordance with the interpretation) conform to the EPBC Act listed community and have the ability to naturally regenerate.

We question this approach for the following reasons:

- Category 3 grasslands are not considered to conform to the EPBC Act listing (see above); and
- The grassland within Category 3 grasslands are not considered to have the ability to respond to assisted natural regeneration.

EPBC Act listing

As noted above, Category 3 grasslands are not considered to comprise the EPBC Act listed community. As such, we request OEH to take into account other factors within the final determination.

Final determination

The TSC Act final determination notes the following:

> *"11. Disturbed remnants are still considered to form part of the community including remnants where the vegetation, either understorey, overstorey or both, would, under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact."*

The Category 3 grasslands within the Project Disturbance Boundary are assessed as not having the ability to respond to assisted natural regeneration and would require active planting of trees and understorey. Evidence regarding the agricultural treatments within two main areas of the Project Disturbance Boundary is presented within the Eastcoast Flora Survey report. One area containing both Category 2 and Category 3 grasslands in the vicinity of the western open cut mining area was initially pasture improved approximately 20 years ago, which included the use of fertilisers and the introduction of improved (exotic) species of pasture and other temperate grasses. Such activities indicate that there has been substantial modification to the natural soil and associated seed bank. This is further supported by the data collected within the Category 2 and Category 3 grasslands which, when assessed using FBA, have a site value score of less than 17. Having such a low score means that the vegetation does not need to be offset for ecosystem credits.

Implications

The *NSW Biodiversity Offsets Policy for Major Projects and Practice note – Offset Threshold for Vegetation Below a Certain Condition Level* (which provides clarification around the discrepancy between the Offsets Policy and the FBA) does not require offsets for ecosystem credits for vegetation that is assessed as having a site value score of less than 17, regardless of whether it is a listed community. Within the Project Disturbance Boundary, grasslands falling within Category 2 and Category 3 have been assessed (using the FBA) as having a site value score of less than 17. As such, regardless of whether these areas are considered to form the listed community, no offsets are required.

Despite the above, we request that the status of the grasslands is not altered, based on the above scientific interpretation and analysis of the relevant guidelines and precedent when assessing projects of a similar nature.

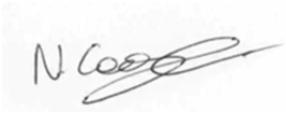
3. CONCLUSION

It is our considered opinion and that of our technical specialist Dr David Robertson of Cumberland Ecology that the relevant State and Commonwealth ecological assessment policies and guidelines have been correctly interpreted and applied within the documentation for the Project. As such, the correct designation of Derived Native Grassland types within the Project Disturbance Boundary is reflected within the Bylong RTS.

We trust this response addresses the two issues raised by OEH in your letter received on 14 March 2016. Please advise should you consider that a meeting is required to specifically discuss these responses further. We also note that additional issues raised by OEH were included in correspondence from DP&E dated 6 May 2016. A response to these issues is being prepared and will be provided in future correspondence.

Should you require anything further in relation to this letter, please contact me on 6575 2000.

Yours faithfully
HANSEN BAILEY



Nathan Cooper
Senior Environmental Scientist

Cc: *Mr Stephen O'Donoghue – NSW Department of Planning & Environment*
Mr Mike Young – NSW Department of Planning & Environment
Ms Kate Gowland – Commonwealth Department of the Environment

APPENDIX B

POTENTIAL FUZZY BOX WOODLAND OFFSET AREA

Coordinate System: MGA Zone 56 (GDA 94)

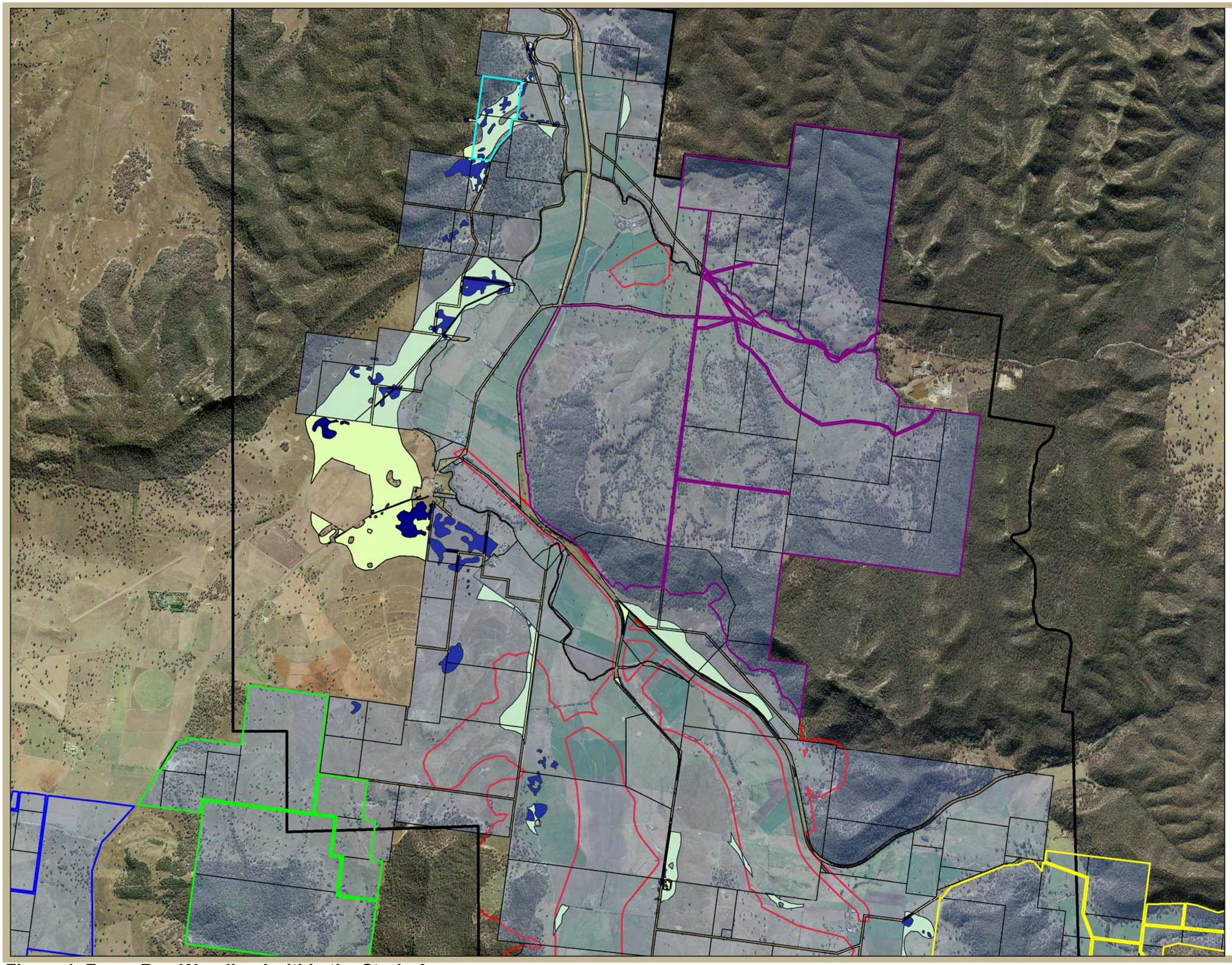


Figure 1. Fuzzy Box Woodland within the Study Area

APPENDIX C

REVISED BOX GUM WOODLAND AND DERIVED NATIVE GRASSLAND MAPPING

Coordinate System: MGA Zone 56 (GDA 94)

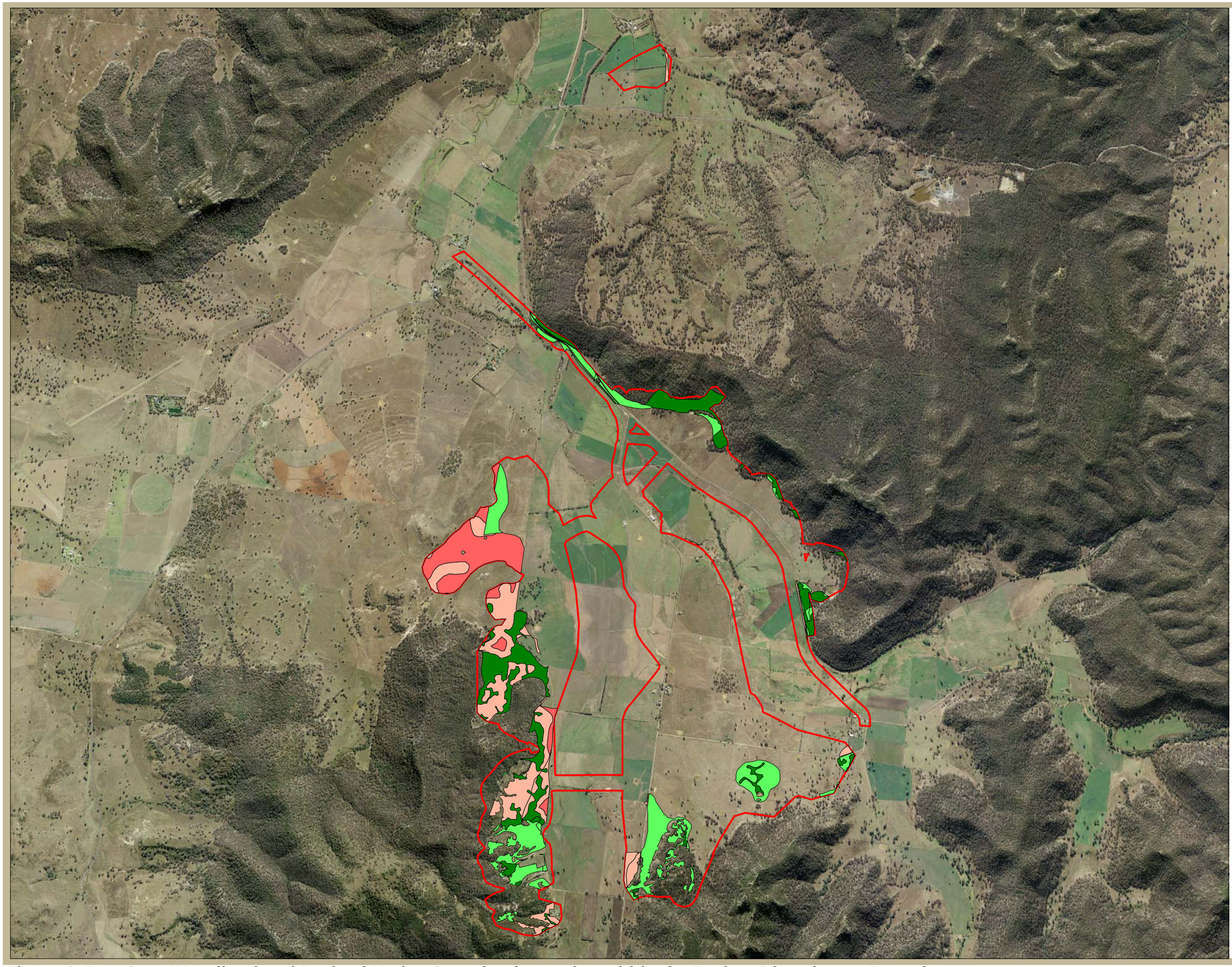


Figure 2. Box Gum Woodland and Derived Native Grassland mapping within the Project Disturbance Boundary

APPENDIX D

EXTENDED CUMULATIVE AHIMS RECORDS

IMPORTANT NOTE

1. This plan was prepared for the sole purposes of the client for the specific purpose of producing a photographic overlay plan. This plan is strictly limited to the Purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.

2. RPS Australia East Pty Ltd will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to:
   a. a Third Party publishing, using or relying on the plan;
   b. RPS Australia East Pty Ltd relying on information provided to it by the Client or a Third Party where the information is incorrect, incomplete, inaccurate, out-of-date or unreasonable;
   c. any inaccuracies or other faults with information or data sourced from a Third Party;
   d. RPS Australia East Pty Ltd relying on surface indicators that are incorrect or inaccurate;
   e. the Client or any Third Party not verifying information in this plan where recommended by RPS Australia East Pty Ltd;
   f. lodgment of this plan with any local authority against the recommendation of RPS Australia East Pty Ltd;
   g. the accuracy, reliability, suitability or completeness of any approximations or estimates made or referred to by RPS Australia East Pty Ltd in this plan.

3. Without limiting paragraph 1 or 2 above, this plan may not be copied, distributed, or reproduced by any process unless this note is clearly displayed on the plan.

4. The aerial photography used in this plan has not been rectified. This image has been overlaid as a best fit on the boundaries shown and position is approximate only.

Legend

- Subsidence Study Area
- Disturbance Boundaries
- Mining Tenements
- Bylong Mining Tenements
- Roads and Tracks
- Railway
- Rivers

AHIMS

- Aboriginal Ceremony and Dreaming
- Aboriginal Resource and Gathering
- Aboriginal Resource and Gathering with PAD
- Ceremonial, Bora Ground with Modified Tree
- Stone Arrangement
- Art
- Artefact Scatter
- Artefact Scatter with PAD
- Artefact Site (Number Unspecified)
- Isolated Find
- Isolated Find with PAD
- Burial, Grave
- Fish Trap
- Grinding Grooves
- Grinding Grooves with Artefacts
- Grinding Grooves with PAD
- PAD
- Hearth, Artefact Scatter with PAD
- Ochre Deposit
- Quarry with Artefacts
- Quarry with PAD
- Scarred Tree
- Carved Tree
- Modified Tree
- Modified Tree, Artefact Scatter with PAD
- Rockshelter
- Shelter with Art
- Shelter with Art & Artefacts
- Shelter with Art & Deposit
- Shelter with Art & Grinding Grooves
- Shelter with Art, Deposit & Midden
- Shelter with Art, Artefacts & PAD
- Shelter with Art & PAD
- Shelter with Artefacts
- Shelter with Artefacts & PAD
- Shelter with Deposit
- Shelter with Deposit & Midden
- Shelter with Deposit, Midden & Grinding Grooves
- Shelter with Art, Grinding Grooves & Deposit
- Shelter with Deposit & Grinding Grooves
- Shelter with Midden & Artefacts
- Shelter with PAD
- Shelter with Water Hole
- Shelter with Water Hole & Artefacts
- Water Hole
- Artefact Scatter Destroyed
- Artefact Site (Number Unspecified) Destroyed
- Shelter with Artefacts Destroyed
- Scarred Tree Destroyed
- Isolated Find Destroyed
- Shelter with Art - Not a Site

N

Ulan Coal Mine
Moolarben Coal Mine
Wilpinjong Coal Mine
Former Mt Penny Project
Kerrabee Dam Project

TURILL
BUNGABA
COPE
STUBBO
ULAN
WILPINJONG
MOOLARBEN
WOLLAR
COOKS GAP
CUMBANDRY
YARRAWONGA
MUNGHORN
CUMBO
COGGAN
BYLONG
MURRUMBO
CANADIAN LEAD
HOME RULE
LINBURN
COOYAL
TICHULAR
KERRABEE
ST FILLANS
FROG ROCK
STONY CREEK
KAINS FLAT
WILBETREE
TOTNES VALLEY
BARIGAN
BUDDEN
UPPER BYLONG
BYLONG RIVER

0 2,500 5,000 10,000 15,000 m

SCALE: 1:175,000 AT A3 SIZE

TITLE : **EXTENDED CUMULATIVE AHIIMS**

LOCATION : **BYLONG**

DATUM:GDA 1994

PROJECTION: GDA 1994 MGA Zone 56

DATE : **29/06/2016**

PURPOSE: **HERITAGE**

VERSION (PLAN BY): A A3 (Natalie.Wood)

DATA SOURCES: RPS Recorded Data, Client supplied Data, OEH

PATH: J:\JOBS\113k\113279 Bylong EIS\10 - Drafting\Arcgis Map Documents\Report Figures\113279 Extended Cum AHIMS AA3 20160628.mxd

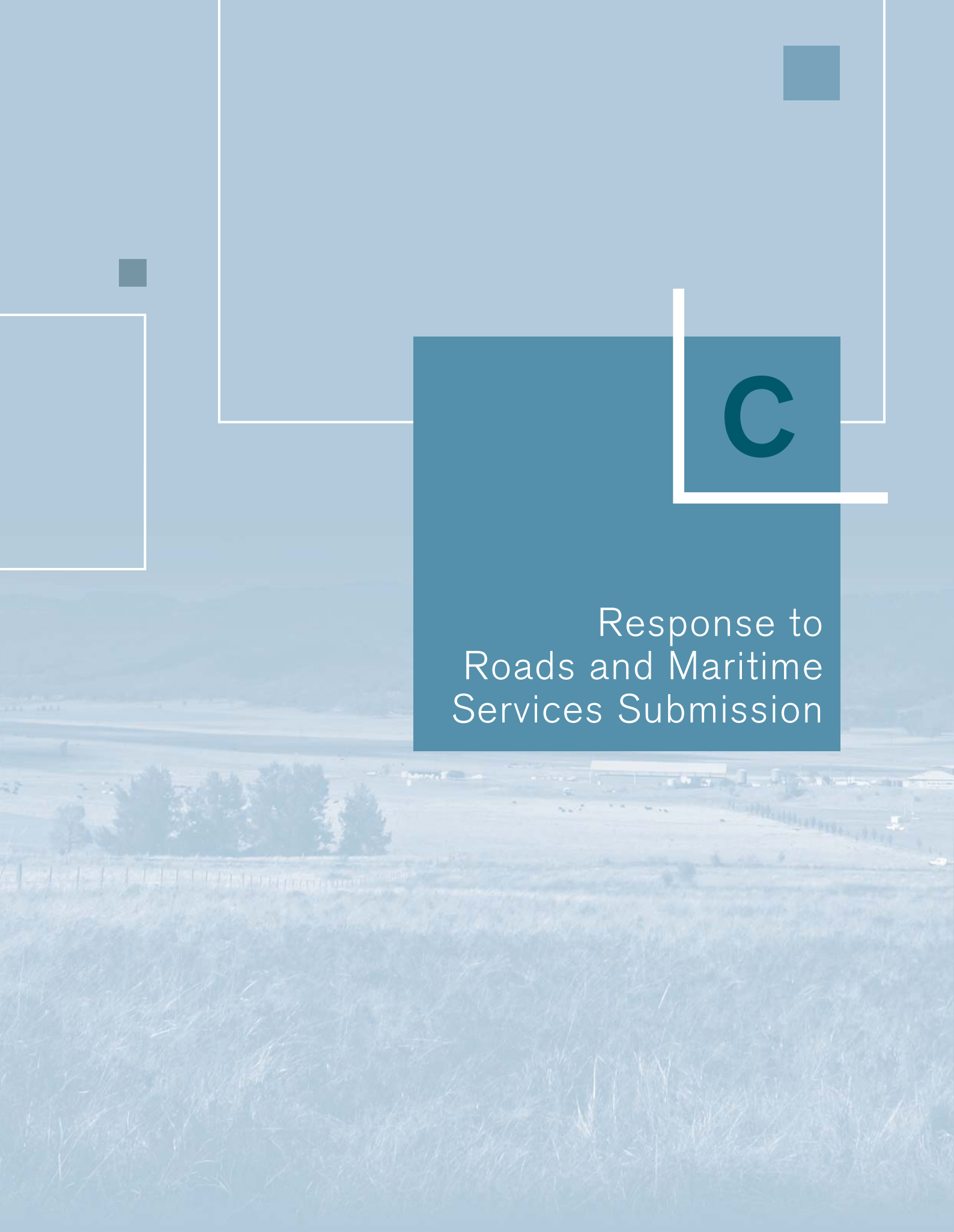
CLIENT: **KEPCO C/O- HANSEN BAILEY**

JOB REF: **PR113279**

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

C

Response to Roads and Maritime Services Submission



BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

14 July 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to Roads and Maritime Submission, Dated 27 April 2016

1. INTRODUCTION

The '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367 for the Bylong Coal Project (the Project) was placed on public exhibition between 23 September and 6 November 2015.

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the EIS. The RTS included responses to the Roads and Maritime (RMS) submission dated 6 November 2015 in relation to road safety and traffic amenity.

RMS provided comment on the RTS in letter dated 27 April 2016 to the Department of Planning and Environment (DP&E) noting that their concerns remain in relation to mine commuter road safety. A meeting was held in Mudgee with the RMS, Mid-Western Regional Council and DP&E on 23 June 2016 to discuss the items raised in the most recent RMS correspondence. This letter has been prepared to respond to RMS comments.

2. RESPONSE TO RMS SUBMISSION

Issue 1

The revised document does not include a road safety audit of the road transport routes required by the proposed mine. The applicant advises that works are either planned or currently underway on Bylong Valley Way and Wollar Road, however, no details are provided of where exactly all these works are and, whether the works planned/underway will provide a higher level of safety over the full extent of the roads or only in part.

Response

The Secretary's Environmental Assessment Requirements (SEARs) did not require a formal road safety audit to be completed for inclusion within the EIS. However, the Traffic and Transport Impact Assessment (TTIA) identified a number of road safety deficiencies on the existing road network based on the traffic consultant's site visit. The TTIA also recommended that a formal road safety audit be undertaken prior to the commencement of construction to develop the appropriate baseline in road conditions.

In light of various stakeholders requesting this detail prior to determination of the project, a formal Road Safety Audit of Wollar Road and Bylong Valley Way was undertaken by Parsons Brinkerhoff in June 2016. These two roads are the main roads to be utilised for the Project. A copy of the Road Safety Audit is included in **Appendix A**.

MWRC has advised that the bitumen sealing of the section of Wollar Road which is currently unsealed will be completed as part of recent funding granted through the Resources for Regions program. These road works will substantially improve/remediate the road safety risks identified within the Road Safety Audit on this section of Wollar Road.

MWRC reported in its 2015 Annual Report that shoulder grading and heavy patching on Bylong Valley Way has been undertaken or is planned to occur during 2016 through its regular road maintenance program.

In relation to planned road improvement works in the Muswellbrook LGA, Muswellbrook Shire Council (MSC) has been undertaking various road improvement works along Bylong Valley Way between the Golden Highway and the western boundary of its LGA since 2015. These works have been programmed and funded through Resources for Regions funding issued in late 2015 and have entailed bank stabilisation works and remediation of other road safety risks on Bylong Valley Way within the MSC LGA.

KEPCO is unaware of any other road maintenance or upgrade works proposed by MWRC or MSC on the Bylong Valley Way or Wollar Road.

The Road Safety Audit (**Appendix A**) has identified a number of existing road safety deficiencies on the Bylong Valley Way and Wollar Road which require various treatments and/or remediation works to improve general road safety on the regional road network.

Parsons Brinckerhoff has completed a more detailed review of crash data provided by RMS between 2010 and 2014. This has confirmed that seven of the 21 (33%) crashes on Wollar Road occurred between Botolbar Road and Ulan Road. This comprises the most western five kilometre section of Wollar Road prior to intersecting Ulan Road. The crash data also indicates that seven of the 21 (33%) crashes occurred on Wollar Road within the Munghorn Gap Nature Reserve between Moolarben Road and Castle Rocks Trail. This is a three kilometre section of Wollar Road. Parsons Brinckerhoff has indicated that targeting these two crash cluster areas with road safety related treatments or measures such as safety barriers, line marking, signage and reduced speed limits would greatly improve the safety at these locations.

KEPCO appreciates that the inclusion of Project-related traffic may emphasise the existing road safety deficiencies on the regional road network and is committed to assisting MWRC and MSC with some funding for critical road safety remediation works. KEPCO is in ongoing discussions with the MWRC and MSC in relation to improving road safety for the regional road network. These discussions have involved context around KEPCO's contribution to assist in the remediation of various road safety deficiencies on the existing road network.

Other funding streams which are available to MWRC and MSC (as the relevant roads authorities) for road safety improvements and road maintenance upgrades include (but not limited to):

- NSW State Blackspot Program;
- Federal Blackspot Program;
- Restart NSW, including:
    - Resources for Regions;
    - Bridges for the Bush; and
    - Fixing Country Roads;
- Federal Bridges Renewal Program; and
- Voluntary Planning Agreements.

It is not a reasonable expectation for KEPCO to fund the total remediation of existing road safety deficiencies on the public road network. However, KEPCO values the safety of its workers and is in ongoing discussions with MWRC and MSC over improving road safety for the regional road network.

Issue 2

> *Limited details have been provided on measures and programs to be employed by the applicant to enforce, or at least encourage, mine staff to travel to and from work safely and/or reduce the exposure of mine staff to risks by minimising travel or providing safe travel options.*

Response

KEPCO understands RMS's concerns in relation to mine commuter road safety. It is noted that these road safety issues have been recognised from the initial mine planning stage of the Project. In this regard, KEPCO has previously made a number of commitments within the EIS and RTS in relation to road safety and fatigue management issues which continue to remain valid.

It is understood following the meeting with RMS on 23 June 2016 that further detail is required for these previous commitments to ensure that they are measureable, enforceable and reportable commitments. This requires detail around the mechanisms through which each of these commitments will be implemented by KEPCO.

In this regard, the following detail is provided for each of the commitments within the EIS:

1. Utilisation of the WAF provides a road safety mechanism in that it minimises the number of construction employees travelling to and from site on a daily basis.

As explained in Section 3.17.3 of the EIS, KEPCO had considered a permanent WAF for the Project due to its remoteness from regional town centres. In light of MWRCs plans to upgrade Wollar Road, the travel time between the Project and the township of Mudgee is reduced, providing a suitable place of residence for the Project's employees and their families. MWRC also expressed that a WAF for the life of the Project would be unfavourable from a community perspective.

MWRC expressed further concerns following the exhibition of the EIS in relation to the operation of a WAF for the construction phase of the Project and has suggested that the Local Area will be able to accommodate the construction workforce. The RTS provided further detailed information and analysis to demonstrate the need for the WAF during the construction of the Project. In light of MWRCs concerns, the RTS also included an assessment of the impacts associated with the Project with no WAF (i.e. traffic, social and economic impacts). The revised TTIA (Appendix D of the RTS) confirms that the road network and its intersections will continue to operate with adequate spare capacity.

MWRC continues to question the need for the WAF for the Project. KEPCO is continuing its discussions with MWRC to demonstrate the need for the approval for a WAF with the size of this facility to be dependent upon accommodation availability studies to be completed prior to the commencement of construction. In this regard, the WAF as a road safety mechanism is limited to the extent that it will be utilised.

2. Commitment for a bus to and from the WAF throughout the construction phase.

KEPCO has committed to utilising a bus to and from the WAF and mine site during the construction phases of the Project and would accept a condition of the Development Consent in this regard. Should the WAF not be required, KEPCO proposes that the car parking facilities will still be available for employee's vehicles. The use of the bus from the WAF to the Project site still be utilised under these circumstances.

3. Commitment to investigate bussing of operational employees – subject to residential distributions of workers.

The Local Area assessed in the EIS and RTS comprised the townships of Mudgee, Ulan, Rylstone and Kandos within the MWRC LGA and Denman and Sandy Hollow within the MSC LGA. The actual distribution of employees will be dependent upon a number of factors beyond KEPCO's control. Accordingly, whilst KEPCO is committed to implementing a bus service, the distribution of employees and willingness of the workforce to utilise a bus service will require careful analysis and consideration prior to implementation.

The open cut operations are proposed to be undertaken by a contractor which has not yet been determined. KEPCO will require, through its contractor management system, that the contractor encourage its employees to use a bus service if available. Conceptually, a bus service could operate from a specific location within Mudgee and a specific location within Rylstone to transport mine workers to and from the Project site by bus.

Should the level of interest by employees dictate that bussing of employees could work from a particular location, then KEPCO will implement a bus service from that particular location. In the instance that the utilisation of the bus service falls below a determined threshold, the bus service will cease to operate from this location.

KEPCO will manage the utilisation of the bus by requiring Journey Management Plans to be prepared for each worker travelling to and from the site. These Journey Management Plans will be completed as part of the recruitment process and in compliance with KEPCO's Health and Safety Management System. Should the circumstances of a worker change, an amended Journey Management Plan will be required to be signed off by the employee's supervisor.

4. Project Fatigue Management Policy to be implemented, including an education program in consultation with emergency service providers.

A best practice Fatigue Management Policy will be developed and implemented as part of the site's Health and Safety Management System. The Fatigue Management Policy will include (at a minimum):

- Purpose and Objectives;
- Statutory Requirements;
- Fatigue Management System and Procedures; including:
    - Identification;
    - Assessment; and
    - Management;
- Training;
- Roles and Responsibilities; and
- Audit, Review and Reporting Process.

Supervisory staff will be trained in the identification, assessment and management of fatigue. Awareness training and management measures which will be detailed within the Fatigue Management Policy may include:

- Fatigue education training to be included within regular toolbox talks;
- Driver education training packages to be communicated to the workforce. This may include briefings from emergency services, RMS representatives, individuals surviving road accidents, etc;
- Non-local employees who travel beyond the Local Area following the completion of their shift roster will be encouraged to return to their temporary place of residence within the Local Area and sleep prior to travelling the next day. This will aim to reduce the potential for employees to work the 12 hour shift and travel a number of hours beyond the Local Area;
- Details of self-assessment fatigue checklists to be completed by employees as part of the sign-on process; and
- Detailed procedures for managing fatigued workers.

KEPCO will contractually require the contractor(s) and associated employees to comply with the requirements of the Fatigue Management Policy.

KEPCO will strongly encourage its contractors and employees to travel safely to and from the site. KEPCO will introduce programs which will encourage employees to notify their supervisors of any other employee not abiding the required safety protocols.

5. Provide detailed information to employees and their families about managing sleep cycles and the impact of fatigue on lifestyle and relationships.

As part of the reporting requirements of the Fatigue Management Policy, an annual fatigue management newsletter will be provided to all staff and contractors. These newsletters will be supported by toolbox talks and training to the workforce.

6. Identify and implement a program to encourage the operations phase workforce to carpool for the Project.

In addition to the commitment for the potential implementation of a bus service for employees from particular locations, KEPCO has also demonstrated its intention to encourage the operations phase workforce to carpool through the 30% carpooling assumption utilised within the traffic and social impact assessments within the EIS. Carpooling benefits to employees include cost savings, reduced wear and tear on vehicles and social interaction which can also assist in the management of fatigue during transit.

Additional measures will be implemented to assist in encouraging carpooling including limiting car parks for workforce vehicles and assisting employees to identify other employees on the same shift cycles commuting from the same residential location.

7. Offer driver education training to workforce.

As noted above, the Fatigue Management Policy will detail the requirement for driver education training to be provided to the workforce to ensure that they are adequately informed of road safety and fatigue management issues for travel on rural roads.

8. Encourage travel outside of school pick up and drop off periods.

As noted within the Revised TTIA, Ogden's Coaches provides a school bus service from Wollar, leaving the town at 7.35 am for travel to schools within Mudgee and returning to Wollar at 4.40 pm. Ogden's Coaches also provides a school bus service from Lue, leaving the town at 7.55 am for travel to schools within Mudgee and returning to Lue at 4.20 pm.

The timing of these two school bus routes do not coincide with staff travel prior to or post shift start (7.00 am or 7.00 pm) or end times (7.00 am or 7.00 pm). It is through the implementation of a 7:00 am to 7:00 pm roster system that school pick up and drop off periods will be avoided.

Office staff which represent a small proportion of the overall workforce are likely to work hours outside the standard shift roster. Therefore, some office staff may travel to the site at times which coincide with school busses on the local road network. KEPCO will provide awareness training to office staff to ensure they are aware of the relevant road rules in relation to school busses (such as slow down to 40 km/hr when lights flash and give way to busses) and provide awareness in relation to the location of bus stops on the relevant road network.

Issue 3

> *The proposed mine is located in an isolated area and is likely to employ staff who live in centres at least one hour travel distance from the mine site. Traffic generated by the mine will significantly increase traffic volumes and change times of travel on public roads that already have poor crash history. Given the isolated location, travel distances, long work hours in the mining industry, existing road environment and crash history, Roads and Maritime strongly recommends the SSD14_6367 not be approved until the applicant provides additional information to address these concerns.*

Response

It should be noted that consistent with the assumptions utilised within the Social Impact Assessment and the TTIA completed for the EIS, the Local Area has been defined as areas within one hour drive of the Project (i.e. Mudgee, Wollar, Ulan, Rylstone, Kandos, Sandy Hollow and Denman), which is considered to be a safe commute time. KEPCO will seek to encourage all non-local hires associated with the operations phase to relocate permanently to within a one hour commute of the Project Boundary.

Additionally, as stated within Section 5.22.3 of the RTS, the Revised TTIA indicates that the regional road network and intersections analysed will perform within capacity and easily accommodate increased traffic from the Project.

Notwithstanding this, KEPCO acknowledges that Project-related usage of the regional road network will increase volumes of traffic on public roads that have a poor crash history. As such, it is anticipated that the additional information provided within the responses to Issue 1 and Issue 2 above addresses RMSs concerns.

Issue 4

> *To assist the applicant in providing the additional information, I suggest that the applicant meet with the Roads and Maritime's Land Use and Road User Safety units. The Road User Safety Unit has experience in and provides assistance to mines throughout the Western Region to develop incentives and initiatives aimed at preventing mine commuter crashes.*

Please confirm with Roads and Maritime that the development application will not be determined until such time as Roads and Maritime has had the opportunity to comprehensively assess the development application following provision of the additional information. To arrange a meeting or to discuss this matter further, please contact Andrew McIntyre, Manager Land Use Assessment

Response

Noted.

KEPCO and its representatives met with the RMS, Mid-Western Regional Council and DP&E on 23 June 2016 in Mudgee. The issues raised within the RMS submission were discussed and this response has been prepared in accordance with the agreed outcomes of the meeting.

3. CONCLUSION

We trust this response addresses the issues raised in the RMS. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

APPENDIX A

Bylong Valley Way and Wollar Road (Existing Road)

Road Safety Audit

HANSEN BAILEY PTY LTD

Bylong Valley Way and Wollar Road (Existing Road)

Road Safety Audit

JUNE 2016

WSP | PARSONS BRINCKERHOFF

Bylong Valley Way and Wollar Road (Existing Road)

Road Safety Audit

Hansen Bailey Pty Ltd

Project no: 2196777A-ITP-RPT-001.docx
Date: June 2016

REV	DATE	DETAILS
0	14/06/2016	Road Safety Audit - Draft
	21/06/2016	Road Safety Audit - Final

AUTHOR, REVIEWER AND APPROVER DETAILS

Prepared by:	Rebecca Temperley	Date: 21/06/2016	Signature:
Reviewed by:	Ryan Miller	Date: 21/06/2016	Signature:
Approved by:	Ryan Miller	Date: 21/06/2016	Signature:

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1 Summary

Audited project:	Bylong Valley Way and Wollar Road Existing Road, Road Safety Audit
Audited for:	Hansen Bailey Pty Ltd
Address:	6/127-129 John Street, Singleton NSW 2330
Telephone:	(02) 6575 2007
Project manager:	Nathan Cooper
Auditors:	Ryan Miller (Level 3) Rebecca Temperley (Level 1)
Audit type:	Existing Road
Commencement meeting:	30 May 2016
Audit date:	31 May and 1 June 2016
Completion meeting:	TBA
Previous audit:	None

This Road Safety Audit has been commissioned by Hansen Bailey Pty Ltd and assessed the existing road conditions for Bylong Valley Way between the Golden Highway and Castlereagh Highway and Wollar Road between Bylong Valley Way and Ulan Road.

The audit identified a number of safety issues ranked as follows:

Intolerable	5
High	17
Medium	56
Low	22

The auditors also identified 23 issues for ‘note only’. These issues were identified during the course of the audit and are for the attention only. There is no obligation to respond to these issues.

2 Introduction

2.1 Audit scope

The purpose of this audit is to identify potential road safety hazards or deficiencies for road users along Bylong Valley Way and Wollar Road.

2.2 Proposed design

Not applicable.

2.3 Audited documentation

The following documentation was provided to the audit team:

Drawing number/Report name	Revision	Description
Bylong Valley Way, Sandy Hollow to Kerrabee, Existing Conditions Road Safety Audit (GHD)	0	Existing conditions road safety audit completed in July 2015.

2.4 Procedures and reference material

The procedures used are those described in the Roads and Maritime Services 2011 *Guidelines for Road Safety Audit Practices*. The existing road audit checklist guide was used by the audit team as a reference.

Other specific documents and manuals referred to during the course of this audit were:

- Austroads 2009, *Guides to Road Design*
- Austroads 2009, *Guides to Road Traffic Management*
- Austroads 2009, *Guide to Road Safety Part 6: Road Safety Audits.*

2.5 Audit team

The audit team comprised the following members:

- Ryan Miller – Lead Level 3 Road Safety Auditor (WSP | Parsons Brinckerhoff)
- Rebecca Temperley – Level 1 Road Safety Auditor (WSP | Parsons Brinckerhoff).

2.6 Responding to the audit

An audit provides an opportunity for an independent team to highlight potential road safety problems and have them formally considered by the project manager in conjunction with all other project considerations. The responsibility of responding to the findings of a road safety audit rests with the designer and/or the project manager, not with the auditor. The designer and/or project manager is under no obligation to accept the audit findings. It is also noted that it is not the role of the auditor to agree to, or approve the project manager's responses to the audit.

3 Road safety audit program

3.1 Commencement meeting

A formal commencement meeting was held on Monday 30 May 2016 between Nathan Cooper of Hansen Bailey Pty Ltd and the WSP | Parsons Brinckerhoff auditor Ryan Miller.

A meeting was also held with Muswellbrook Shire Council on Monday 30 May 2016 to inform Council of the audit proposed and the methodology to be utilised. Council also advised that they had an audit completed last year and would provide the report to Hansen Bailey Pty Ltd for information. This meeting was attended by Neil Pope, Peter Higgins, Edi Ediriwickrama, Nathan Cooper and Ryan Miller. Council confirmed that they were comfortable with the audit approach.

3.2 Site inspection

The audit team visited the two lengths of road over two separate days and including:

- Bylong Valley Way on Tuesday 31 May 2016 during day light and dusk conditions in fine and dry weather
- Wollar Road on Tuesday 31 May 2016 during dusk and night conditions in fine and dry weather
- Bylong Valley Way on Wednesday 1 June 2016 prior to sunrise and in day light conditions in fine and dry weather
- Wollar Road on Wednesday 1 June 2016 in day light conditions in fine and dry weather.

3.3 Completion meeting

A formal completion meeting is yet to be held.

4 Road safety audit findings

4.1 The risk assessment system

Each hazard has been recorded and assessed in accordance with the Austroads *Guide to Road Safety: Part 6 Road Safety Audit* (Third Edition, 2009). The guide recommends a risk matrix be used to determine the level of risk associated with each hazard. This risk matrix is described below.

4.1.1 Estimated crash frequency

The probable frequency of an incident occurring as a direct result of the hazard was determined using the criteria displayed in Table 4.1.

Table 4.1 Crash frequency

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Source: Austroads

4.1.2 Estimated crash severity

The likely severity of an incident which occurred as a direct result of the hazard was determined using the criteria in Table 4.2.

Table 4.2 Crash severity

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on a freeway. Car runs into crowded bus stop. Bus and petrol tanker collide. Collapse of a bridge or tunnel.
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision. High or medium-speed collision with a fixed roadside object. Pedestrian or cyclist struck by a car/vehicle.
Minor	Likely minor injury	Some low-speed vehicle collisions. Cyclist falls from bicycle at low speed. Left-turn rear-end crash in a slip lane.

Severity	Description	Examples
Limited	Likely trivial injury or property damage only	Some low-speed vehicle collisions. Pedestrian walks into object (no head injury). Car reverses into post.

Source: Austroads

4.1.3 Deemed level of risk

The risk matrix in Table 4.3 was used to assess the level of risk for each hazard. The risk matrix uses the Frequency and Severity determined above to determine the likely level of risk for each hazard.

Table 4.3 Level of risk

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Source: Austroads

4.2 Road safety audit findings

The audit findings are documented in Table 4.4 for Bylong Valley Way and Table 4.5 for Wollar Road which provides:

- → specific details of each of the audit findings identified during the audit
- → a risk level rating for each of the audit findings.

In accordance with Roads and Maritime Services (Roads and Maritime) preferred practice this road safety audit does not include recommended actions.

A summary of the hazards which achieve a high or above level of risk rating is provided in Table 4.6.

Table 4.4 Road safety audit findings – Bylong Valley Way between Castlereagh Highway and Golden Highway

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
1.	Ch 0.5 km and 1.5 km from Castlereagh Highway	Unprotected large road edge drop offs at culverts within clear zone left hand side. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)
2.	Ch 2.1 km from Castlereagh Highway	Unprotected road edge drops offs around 1m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)
3.	Ch 2.6 km from Castlereagh Highway	Start of guardrail on left hand side has no end black and yellow chevron marking.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
4.	Ch 3.2 km from Castlereagh Highway	Unprotected road edge drops offs around 1 m in height within clear zone left hand side. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
5.	Ch 3.5 km from Castlereagh Highway	Narrow road lane widths approximately 2.8–3.0 m wide. This could lead to vehicles running off road or colliding when passing simultaneously, more so for larger vehicles. 	**High** (Occasional/Serious)
6.	General	Edge lane linemarking not present throughout. Some sections may not permit edge lane linemarking due to narrow road widths.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
7.	Ch 4.8 km from Castlereagh Highway	Unprotected road edge drops offs around 2 m in height within clear zone right hand side of photo. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
8.	Ch 4.8–5.0 km from Castlereagh Highway	Unprotected power poles located within the clear zone. A vehicle travelling at high speed and colliding with the power pole could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
9.	Ch 6 km from Castlereagh Highway	Faded edge of lane linemarking. Vehicles could travel off the road into shoulder and verge area and potentially lose control leading to minor injury. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
10.	Ch 8 km from Castlereagh Highway	Several large trees located within the clear zone on a curve and with edge lane linemarking stopped due to narrowing lane widths. This could lead to vehicles travelling off road on curve and losing control and striking a tree/s. 	**Medium** (Serious/Improbable)
11.	Ch 10 km from Castlereagh Highway	Centre linemarking faded at this location.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
12.	Ch 10.8 km from Castlereagh Highway	Large trees located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
13.	Ch 13.2 km from Castlereagh Highway	There is no advisory speed limit sign on approach to this curve. Vehicles travelling at high speed may take this curve at a higher speed leading to loss of vehicle control or run off road crashes. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
14.	Ch 14.2 km from Castlereagh Highway	There is no advisory speed limit sign on approach to this curve. Vehicles travelling at high speed may take this curve at a higher speed leading to loss of vehicle control or run off road crashes. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
15.	Ch 15 km from Castlereagh Highway	There is no advisory speed limit sign on approach to this curve or chevron alignment markers (CAMs) on the curve. To add to this there is a large road drop off on the right hand side (of the photo). Vehicles travelling at high speed may take this curve at a higher speed leading to loss of vehicle control or run off road crashes. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
16.	Ch 15.5 km from Castlereagh Highway	Unprotected wildlife crossing with steel frames located within the clear zone. A vehicle travelling at high speed and colliding with this structure could lead to serious injury or death. There is no height clearance marker on this structure. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
17.	Ch 15.5–15.6 km from Castlereagh Highway	Unprotected road edge drops offs around 5 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
18.	Ch 16.7 km from Castlereagh Highway	Unprotected road edge drop offs at culverts within clear zone left hand side. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to minor injury. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
19.	Ch 17 km from Castlereagh Highway	Narrow lane widths around curve approaching Kandos within 80 km/h speed limit zone. This could lead to vehicles running off road or colliding when passing simultaneously, more so for larger vehicles. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
20	Ch 19.2 km from Castlereagh Highway	Unprotected culvert headwall and road drop at water crossing just outside of Kandos within 100 km/h speed limit zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
21.	Ch 19.3 km from Castlereagh Highway	Start of guardrail on left hand side has no end black and yellow chevron marking. 	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
22.	Ch 24.6 km from Castlereagh Highway	Delineation through this intersection is ambiguous and poorly linemarked. This is entering the town of Rylstone within a 50 km/h speed zone. Vehicles may travel on the incorrect side of the road or run off road at this location. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
23.	Ch 25.4 km from Castlereagh Highway	No hazard width markers at Cudgegong River bridge crossing. 	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
24.	Ch 25.7 km from Castlereagh Highway	Poor road pavement and faded rail level crossing ahead pavement markings within 50 km/h speed zone exiting Rylstone. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
25.	Ch 25.8 km from Castlereagh Highway	Unprotected large road drop off within 50 km/h speed zone prior to guardrail start. Start of guardrail on left hand side has no end black and yellow chevron marking. 	**Low** (Minor/Improbable)
26.	Ch 27.8 km from Castlereagh Highway	Large trees located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury or death.	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
27.	Ch 29.3 km from Castlereagh Highway (north of Lue Road intersection)	General bridge load limit on timber bridges. 	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
28.	Ch 29.7 km from Castlereagh Highway	Old guardrail straight on without chevron black and yellow marking on guard rail ends. The guardrail positioned in this way could act as a spearing object if hit head on by a vehicle leading to serious injury. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
29.	Ch 32.9 km from Castlereagh Highway	Unprotected road edge drops offs around 2 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
30.	Ch 34.2 km from Castlereagh Highway	Old guardrail straight on without chevron black and yellow marking on guard rail ends. The guardrail positioned in this way could act as a spearing object if hit head on by a vehicle leading to serious injury. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
31.	Ch 35.2 km from Castlereagh Highway	There is a drop off from pavement edge to road shoulder on inside of curve. This could lead to vehicles losing control if travelling off the road at this location. The mesh fencing and guide posts do not provide adequate protection to the large road drop offs at this location. A vehicles running off the road at this location could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
32.	Ch 36.3 km from Castlereagh Highway	The road width at the Reedy Creek bridge crossing is narrow at 5.6 m width. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. 	**High** (Serious/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
33.	Ch 36.7 km from Castlereagh Highway	Unprotected power poles located within the clear zone. A vehicle travelling at high speed and colliding with the power pole could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
34.	Ch 40.7 km from Castlereagh Highway	Narrow road lane widths at this location. This could lead to vehicles running off road or colliding when passing simultaneously, more so for larger vehicles. There is also old guardrail at this location which is damaged in a few sections. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
35.	Ch 41 km from Castlereagh Highway	The mesh fencing and guide posts do not provide adequate protection to the large road drop offs at this location. A vehicles running off the road at this location could lead to serious injury or death.  	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
36.	Ch 46.7 km from Castlereagh Highway	Tight horizontal curves on steep grades within 35 km/h advisor speed limit. Larger vehicles may straddle lanes at these locations. This may lead to low speed side swipe vehicle collisions or run off road crashes. 	**High** (Minor/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
37.	Ch 47.5 km from Castlereagh Highway	Unprotected road edge drops offs around 2 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
38.		Overgrown vegetation on inside of curve interferes with driver sight lines and distance around the curve. This could lead to vehicles straddling across the centre line or running off the road at this location. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
39.	Ch 60 km from Castlereagh Highway	There is no advisory speed limit sign on approach to this curve. Vehicles travelling at high speed may take this curve at a higher speed leading to loss of vehicle control or run off road crashes. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
40.	Ch 68.6 km from Castlereagh Highway	Unprotected large road edge drop offs at culverts within clear zone left hand side. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
41.	Ch 71 km from Castlereagh Highway	There is a large tree located within the clear zone on a curve. A vehicle travelling at high speed and colliding with the tree could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
42.	Ch 76.6 km from Castlereagh Highway	Narrow road lane widths at this location just north of Bylong town within 50 km/h speed zone. This could lead to vehicles running off road or colliding when passing simultaneously, more so for larger vehicles. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
43.	Ch 76.8 km from Castlereagh Highway (at Upper Bylong Road intersection)	Gravel tracking is present at intersection with Upper Bylong Road. This could lead to increased pavement damage and loss of vehicle traction around the curve. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
44.	Ch 77.6 km from Castlereagh Highway	Unprotected power poles located within the clear zone in 50 km/h speed zone. A vehicle travelling at high speed and colliding with the power pole could lead to serious injury. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
45.	Ch 77.2 km from Castlereagh Highway	Large trees located within the clear zone within a 50 km/h speed zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
46.	Ch 78.5 km from Castlereagh Highway	Faded level railway crossing pavement markings on approach to level railway crossing. 	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
47.	Ch 0 km from Wollar Road	General poor road condition, gravel tracking and faded linemarking at intersection and adjacent to level railway crossing. This could lead to vehicles travelling off course, losing control and loss of vehicle traction. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
48.	Ch 0.2 km from Wollar Road	Unprotected culvert headwall within 100 km/h speed limit zone. A vehicle travelling at high speed off the road at this location would lose control due to impact and not be recoverable leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
49.	Ch 1.1 km from Wollar Road	Unprotected power pole located within the clear zone inside of curve. A vehicle travelling at high speed and colliding with the power pole could lead to serious injury. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
50.	Ch 2.9 km from Wollar Road	The pavement is in poor condition with sporadic patching and edge of pavement breaking apart. The shoulder at this location is currently closed for works. 	**Low** (Minor/Improbable)
51.	Ch 3.2 km from Wollar Road	Unprotected road edge drops offs within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
52.	Ch 3.2–4.0 km from Wollar Road	The speed and curve advisory sign is blocked by vegetation at this location. This could lead to run off road crashes. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
53.	Ch 4.0 km from Wollar Road At Bylong Quarry access	Gravel tracking, poor pavement quality and water ponding at Quarry access intersection. This could lead to loss of vehicle control and vehicle traction. 	**Low** (Minor/Improbable)
54.	Ch 7.3 km from Wollar Road	Unprotected road edge drops offs greater than 2 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
55.	Ch 7.8 km from Wollar Road	Vertical (crest) and horizontal curve at this location leads to a short sight distance loss of the road ahead. No curve or speed advisory signage provided. This could lead to run off road crashes at high speed leading to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
56.	Ch 8.7 km from Wollar Road	Large road drop off with no effective barrier protection. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death. Old guardrail positioned straight on without chevron black and yellow marking on guard rail ends. The guardrail positioned in this way could act as a spearing object if hit head on by a vehicle leading to serious injury. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
57.	Ch 10.9 km from Wollar Road	General poor pavement on curve with pavement shoving and pot holes. Vehicles travelling at high speed on this curve may lose control or lose vehicle traction. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
58.	Ch 11.5 km from Wollar Road Murrumbo Creek Causeway Crossing	Potential for flooding across causeway at this location. Water across the road at this location may lead to loss of vehicle control at low speeds. 	**Low** (Minor/Improbable)
59.	Ch 12.6 km from Wollar Road	Large tree located within the clear zone on outside of curve. A vehicle travelling at high speed and colliding with the tree could lead to serious injury.	**Medium** (Serious/Improbable)
60.	Ch 15.9 km from Wollar Road	Large tree and large road drop off adjacent to culvert located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury. Likewise a vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)
61.	Ch 16.7 km from Wollar Road	Large tree located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury.	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
62.	Ch 16.9 km from Wollar Road Railway overbridge	The road lanes are narrow on approach to, underneath and departure of the overhead rail bridge. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. There are also no hazard width markers or clearance height markers attached to the bridge. Oversize vehicles have the potential to connect with the bridge structure due to lack of width or clearance height markers. 	**High** (Serious/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
63.	Ch 18.6 km from Wollar Road	There is no advisory speed limit or curve sign on approach to this curve or CAMs on the curve. Vehicles travelling at high speed may take this curve at a higher speed leading to loss of vehicle control or run off road crashes. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
64.	Ch 18.8 km from Wollar Road	There are sections of steep terrain where rock falls adjacent to the roadway are noticeable. Large rocks falling from height could lead to serious vehicle damage, injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
65.	Ch 20 km from Wollar Road	The horizontal curve at the peak of the road where the two Council boundaries meet is not delineated. Tight curves around blind corners without centre linemarking could lead to larger vehicles straddling lanes at these locations. This may lead to low speed side swipe vehicle collisions or run off road crashes. 	**High** (Minor/Probable)
66.	Ch 20 km from Wollar Road	There are numerous curves in this vicinity where a longer or oversize heavy vehicle may struggle to undertake adequate turning manoeuvres which may require vehicle travelling off road pavement, travelling across centre of road onto opposing travel lane or making several turns (including reversing) to undertake turns. This may lead to head-on, side swipe, run off road and rear-end crashes at low speed.	**High** (Minor/Probable)
67.	General	There is a lack of advisory speed limit, curve or CAMs on curved sections of road within Muswellbrook Shire Council LGA.	**Note only**
68.	General	There are numerous curves where no centre line delineation is provided. Larger vehicles are likely to track onto the incorrect side of road around curves leading to side swipe vehicle collisions.	**High** (Minor/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
69.	Ch 27.7 km from Wollar Road	The road narrows around this bend with no centre delineation and poor sight distance due to overgrown vegetation. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. 	**High** (Serious/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
70.	Ch 38.2 km from Wollar Road	The road narrows around this bend with no centre delineation and poor sight distance due to overgrown vegetation. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. This is adjacent to a rest area. 	**High** (Serious/Occasional)
71.	Ch 45.5 km from Wollar Road Baerami Creek Crossing	There is a lack of centre linemarking on approach and departure of the Baerami Creek bridge particular on the western side of the crossing where the road curves prior to the bridge crossing. This could lead to side swipe vehicle collisions when passing simultaneously.	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
72.	Ch 58.2 km from Wollar Road	The road narrows on this bend with poor sight distance and concealed driveways. This could lead to side swipe vehicle collisions when passing simultaneously. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
73.	Ch 59.7 km from Wollar Road Golden Highway intersection	There is no centre linemarking approaching the T intersection with the Golden Highway and no yield lines or intersection sign controls at the intersection. This could lead to poor positioning of vehicles, vehicles overrunning the intersection and vehicles cutting the intersection leading to side swipe collisions. 	**Low** (Minor/Improbable)
74.	General	Lack of linemarking in general on Bylong Valley Way within Muswellbrook Shire Council LGA.	**Note only**
75.	General	Bylong Valley Way is subjected to flooding in low lying areas.	**Note only**
76.	General	A large number of wildlife (primarily kangaroos and wombats) were seen on the side of the road. There is the hazard of vehicles hitting moving wildlife at high speed leading to run off road, side swipe or head on crashes.	**Intolerable** (Serious/Probable)
77.	Ch 12.8 km from Golden Valley Highway	There is an 85 km/h advisory speed sign fallen to the ground at this location.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
78.	Ch 27 km from Golden Valley Highway	Delineation of road pavement ahead is unclear and may lead drivers to take the wrong path on this bend. There is potential for vehicles to travel between new guardrail and fencing at this location and not the main road. This could lead to run off road crashes at high speed. Photo is looking in opposing direction to the comment above but shows the location). 	**Medium** (Serious/Improbable)
79.	Ch 30.5 km from Golden Valley Highway	The road pavement condition adjacent to the slope stabilisation and rock fencing is only in fair condition. Over time this pavement would deteriorate leading to pot holes and water ponding.	**Note only**
80.	Ch 42.7 km from Golden Valley Highway	The bridge has no hazard width markers.	**Note only**
81.	Ch 45 km from Golden Valley Highway	Left arrow with 65 km/h advisory speed limit sign is not retro-reflective. Located near Reduced Speed sign.	**Note only**

Table 4.5 Road safety audit findings – Wollar Road between Bylong Valley Way and Ulan Road

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
1.	General	Guideposts are lacking in several locations along Wollar Road.	**Note only**
2.	General	Unsealed road subject to potholes and water ponding. This could lead to run off road crashes, loss of vehicle control and side-swipe crashes.	**Intolerable** (Serious/Probable)
3.	General	Wollar Road is subjected to flooding in low lying areas.	**Note only**
4.	General	A large number of wildlife (primarily kangaroos and wombats) were seen on the side of the road. There is the hazard of vehicles hitting moving wildlife at high speed leading to run off road, side swipe or head on crashes.	**Intolerable** (Serious/Probable)
5.	Ch 0 km from Bylong Valley Way	Warning sign recommending drivers 'Ride to The Conditions of The Road'. While undertaking this audit, our vehicle travel was at a maximum of 80 km/h on the unsealed section of Wollar Road. This was in fine and dry weather conditions and using a 4WD vehicle.	**Note only**
6.	Ch 1.4 km from Bylong Valley Way	There is a dip in the road and associated road drop off adjacent to culvert in this location within close proximity of rail bridge. Water ponding at this location could lead to loss of vehicle control. Vehicles running off the road at this location at medium speeds could lead to serious injury. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
7.	Ch 2.9 km from Bylong Valley Way	The road narrows around this bend. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. 	**High** (Serious/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
8.	Ch 3.2–3.4 km from Bylong Valley Way	Large trees located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury or death.  	**High** (Serious/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
9.	Ch 3.4 km from Bylong Valley Way	Unprotected large road edge drop offs of around 4 m within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)
10.	Ch 3.5 km from Bylong Valley Way	A large rock/boulder is located within the clear zone. A vehicle travelling at medium/high speed and colliding with the large rock/boulder could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
11.	Ch 6.7 km from Bylong Valley Way	Narrow road sections. Large vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
12.	Ch 7.8 km from Bylong Valley Way	There is no curve advisory sign at this location. This could lead to run off road crashes at lower speeds. 	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
13.	Ch 8.5 km from Bylong Valley Way	The left curve sign is not reflective at night. 	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
14.	Ch 9.7 km from Bylong Valley Way	There is poor sight distance due to the crest in the road. The road narrows at this location and is on a curve. There is potential for head-on or side swipe collisions at this location leading to serious injury or death. 	**Intolerable** (Serious/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
15.	Ch 9.9 km from Bylong Valley Way	There is faded centre linemarking on sealed section of road where road narrows around curve. This could lead to run off road or side swipe collisions at this location. 	**Medium** (Minor/Occasional)
16.	Ch 10.2 km from Bylong Valley Way	General poor pavement quality on tight hairpin curve. Vehicles travelling a low speed may lose traction at this location.	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
17.	Ch 10.2–10.3 km from Bylong Valley Way	Tight horizontal curves and winding road with not enough room for two heavy vehicles or heavy and light vehicle to pass simultaneously comfortably at low speeds.  	**High** (Minor/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
18.	Ch 10.2–10.3 km from Bylong Valley Way	There are numerous curves in this vicinity where a longer or oversize heavy vehicle may struggle to undertake adequate turning manoeuvres which may require vehicle travelling off road pavement, travelling across centre of road onto opposing travel lane or making several turns (including reversing) to undertake turns. This may lead to head-on, side swipe, run off road and rear-end crashes at low speed.	**High** (Minor/Probable)
19.	Ch 10.3 km from Bylong Valley Way	Large vehicle wheel tracking around curve evident in shoulder area. This could lead to pavement deterioration and frayed edge of pavement. 	**High** (Minor/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
20.	Ch 10.3 km from Bylong Valley Way	Steep road grades with narrow road lane widths, poor linemarking and falling rocks within slow speed area. Falling rocks at this location may lead to vehicle damage, serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
21.	Ch 10.4 km from Bylong Valley Way	Poor pavement quality including pot holes and patching adjacent to steep rock terrain. This could lead to vehicle damage and loss of vehicle control. 	**Medium** (Minor/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
22.	Ch 10.7 km from Bylong Valley Way	Large tree located within the clear zone. A vehicle travelling at high speed and colliding with the tree could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
23.	Ch 11.2 km from Bylong Valley Way	The road narrows around this tight curve. Vehicles passing simultaneously at this location could lead to side swipe vehicle collisions and loss of vehicle control. 	**Intolerable** (Serious/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
24.	Ch 14.1 km from Bylong Valley Way	Lack of curve advisory speed signage or CAMs on the curve near intersection with Ringwood Road. In addition to this, there is poor sight distance around the curve for drivers. This could lead to run off road or side swipe collisions at this locations. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
25.	Ch 15.8 km from Bylong Valley Way	Large trees located within the clear zone. A vehicle travelling at high speed and colliding with the trees could lead to serious injury or death. 	**Medium** (Serious/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
26.	Ch 25.2 km from Bylong Valley Way (at Barigan Road intersection)	Gravel tracking at this intersection is quite evident. This could lead to loss of vehicle control due to loss of traction at this curve within slow speed environment. 	**Medium** (Minor/Occasional)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
27.	Ch 25.2 km from Bylong Valley Way	The priority of the intersection of Wollar Road and Barigan Road is unclear and ambiguous. This is due to faded or lack of yield line marking and the yield required on Wollar Road due to single lane bridge crossing. Gravel tracking and unsealed side road adds to the problem. This could lead to slow speed rear-end collisions. 	**High** (Minor/Probable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
28.	Ch 25.2 km from Bylong Valley Way	There is a single lane bridge crossing outside of Wollar town. Vehicles approaching this breaking at the last moment due to oncoming vehicle utilising the bridge could lead to rear-end crashes. 	**High** (Minor/Probable)
29.	Ch 25.2 km from Bylong Valley Way	The width and strength (load limit) of this bridge may not be suitable for oversize or overmass vehicles to traverse. This could lead to vehicles running off the bridge crossing into adjacent drop off and bridge damage at low speed leading to bridge collapse and vehicle damage and injury.	**High** (Minor/Probable)
30.	Ch 25.2 km from Bylong Valley Way	The bridge has no barrier protection with large drop off. There is also no pedestrian facility across the bridge. This could lead to run off road crashes or vehicle/pedestrian collisions at slow speed.	**Low** (Minor/Improbable)

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
31.	Ch 32.2 km from Bylong Valley Way	General poor pavement condition, dip in road and lack of edge lane linemarking could lead to vehicles travelling at high speed running off the road or losing control of the vehicle at this location. 	**Medium** (Serious/Improbable)
32.	Ch 33.6 km from Bylong Valley Way	Right curve sign in poor condition and facing away from road.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
33.	Ch 36.1 km from Bylong Valley Way	Left curve sign covered by vegetation. 	**Note only**
34.	Ch 36.6 km from Bylong Valley Way	Narrow road width with frayed pavement edges. This could lead to run off road or loss of vehicle control at this location.	**Medium** (Serious/Improbable)
35.	Ch 40 km from Bylong Valley Way	Some CAMS obstructed by vegetation.	**Note only**
36.	Ch 40.3 km from Bylong Valley Way	Poor edge pavement quality and loss of edge lane linemarking. This could lead to run off road or loss of vehicle control at this location.	**Medium** (Serious/Improbable)
37.	Ch 43.5–43.8 km from Bylong Valley Way	Unprotected road edge drops offs greater than 2 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable)
38.	Ch 43.8 km from Bylong Valley Way	Poor pavement condition on curve.	**Note only**
39.	Ch 53.2 km from Bylong Valley Way	Unprotected road edge drops offs greater than 2 m in height within clear zone on straight section. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable
40.	Ch 54.8 km from Bylong Valley Way	New bridge with no lines or markings as yet. Likely to be installed in due course.	**Note only**

No.	Location/Road safety category	Description of findings	Risk rating (severity/ frequency)
41.	Ch 56.8 km from Bylong Valley Way	Unprotected road edge drops offs greater than 2 m in height within clear zone. A vehicle travelling at high speed off the road at this location would lose control and not be recoverable leading to serious injury or death.	**Medium** (Serious/Improbable
42.	Ch 59.1 km from Bylong Valley Way	Dip after (west of) Botobolar Road intersection with letterboxes due to culvert and pavement unevenness. This could lead to loss of vehicle control.	**Low** (Minor/Improbable)

Table 4.6 Road safety audit findings – Summary of risks rated high or above

Risk Rating	General finding description in summary
Intolerable	A large number of wildlife (primarily kangaroos and wombats) were seen on the side of the road.
Intolerable	Unsealed road subject to potholes and water ponding.
Intolerable	Narrow road on curve with crest and poor sight distance.
High	Narrow road widths and hence lane widths.
High	Narrow road width (lane widths) across bridge crossings.
High	Narrow road width (lane widths) beneath rail overbridge.
High	Tight horizontal curves on steep grades.
High	Narrow road on curves with poor sight distance.
High	Lack of delineation/signage on curves with poor sight distance.
High	Larger vehicle manoeuvrability around tight curves.
High	Large trees within the clear zone.
High	Single lane bridge crossing.
High	Suitability of single lane bridge width and bridge loading capacity.
High	Ambiguous intersection linemarking and priority controls.

5 Formal statement

The findings and opinions in the report are based on the examination of the existing road conditions on Bylong Valley Way and Wollar Road as well as the specific road and environs, and might not address all concerns existing at the time of the audit. The Auditors have endeavoured to identify features of the road that could be modified or removed in order to improve safety. It should be noted that although every effort has been made to identify potential safety hazards, no guarantee can be made that every deficiency has been identified. It must also be recognised that safety cannot be guaranteed since no road can be regarded as absolutely safe. While every effort has been made to ensure the accuracy of this report, it is made available strictly on the basis that anyone relying on it does so at their own risk without any liability to the Auditors.

R. Miller

Ryan Miller – Lead auditor
Level 3 Lead Road Safety Auditor
Identification number: RSA-02-0223
Signature date: 21/06/2016

Rebecca Temperley – Team member
Level 1 Road Safety Auditor
Identification number: RSA-TBA
Signature date: 21/06/2016

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Response to Mid-Western Regional Council Submission

11 August 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to Mid-Western Regional Council Submission, Dated 26 April 2016

1. INTRODUCTION

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367.

This letter has been prepared to provide a response to the Mid-Western Regional Council's (MWRC) letter of 26 April 2016 to the Department of Planning and Environment (DP&E) on the RTS.

A meeting was held with the MWRC General Manager on 16 June 2016 to discuss the issues raised in the MWRC letter of 26 April 2016. During this meeting, it was agreed in principle that KEPCO would prepare a draft Development Consent condition for the proposed Workforce Accommodation Facility (WAF) for MWRC's consideration of a conditional approval, based on the demonstrated need and assessment for the WAF at the time.

On 20 July 2016, a draft Development Consent condition was reported to the MWRC Ordinary Meeting. MWRC resolved that whilst they continue to support the Bylong Coal Project (the Project), they do not support the use of a WAF for the Project. MWRC's main reason for not supporting the temporary WAF is simply that the region has previously supported employees for the construction phases of other mining projects in the absence of a WAF.

This letter has been prepared following the additional consultation with and feedback from MWRC. The Social Impact Assessment (SIA) prepared as part of the EIS and relevant supporting information presented within the RTS included the relevant assessment of the Project workforce and workforce accommodation strategy and also demonstrated the Project's need for the WAF. In the absence of any current detailed assessment of housing availability provided by MWRC which confirms otherwise, KEPCO continues to seek approval for a temporary WAF to:

- Provide the appropriate risk management mechanism during the critical construction phase of the Project by ensuring housing availability within the Local Area (i.e. within a one-hour commute), thus reducing unnecessary road travel time for employees and reduce exposure for other road users; and
- Meet housing accommodation demands during the construction phase of the Project, whilst not adversely impacting the Mudgee housing and short-term accommodation markets.

In addition to the factual evidence provided within the RTS on accommodation availability for Project employees within the Local Area (i.e. RTS Appendix E - Workforce Accommodation Survey), this letter provides further justification for the WAF for DP&E's consideration in terms of its consistency with MWRC's planning principles and policies.

2. RESPONSE TO MID-WESTERN REGIONAL COUNCIL SUBMISSION

2.1 TEMPORARY WORKERS ACCOMMODATION FACILITY

Issue 1

After reviewing Kepco's response to submissions, Council would like to reconfirm its position in relation to the issues/concerns identified in the original submission to the EIS dated 20 November 2015.

It is acknowledged that Kepco has undertaken further work to assess the need for a Temporary Workers Accommodation (TWA) facility. This analysis has resulted in a revision of the accommodation requirements to support the workforce during the construction phase of the project. The revision includes both a reduction in the number of beds provided in a TWA facility as well as a reduction in the number of years over which the facility would be utilised. Kepco has also presented additional information regarding the availability of short and longer term accommodation as supporting evidence.

Despite these revisions, Council does not support the use of a TWA facility for the construction phase of the Kepco Bylong Coal Project.

The analysis undertaken by Kepco to demonstrate that there is insufficient accommodation available is inconsistent with the past experience. The Mid-Western Region has accommodated the significant expansion of multiple mining projects at the same time in recent years and the local housing market has responded to the demand for additional housing and short term/serviced accommodation.

Council is of the firm view that the local housing and accommodation market can satisfy the requirements of the project and respond appropriately to ensure that the construction workforce can be accommodated. This will generate positive economic benefits for the Region and also continue to support the social objective of one community.

Given Council's position in relation to a TWA facility, it is important that a traffic and transport scenario without this facility is not discounted in the project planning.

Response

KEPCO acknowledges MWRC's overlying strategy to facilitate the development of the Local Area in order to manage the growth pressures from mining related development and its position in relation to the temporary WAF for the construction phase of the Project.

Notwithstanding this, KEPCO remains concerned about the potential risk and uncertainty for accommodating its construction employees within the Local Area. This uncertainty is supported by the investigations into accommodation availability within the Local Area and the forecast Project demands (as presented in Appendix E of the RTS). It is also supported by the overlying assumption that the Wollar Road will be upgraded for use by Project-related employees which would be required should the WAF not be approved (i.e. to allow the township of Mudgee to be located a one-hour commute from the Project).

MWRC advises that the Mid-Western Regional Council Local Government Area (MWRC LGA) has previously accommodated the construction employees for other mines within the region. However, the Project is located more remote from Mudgee and other regional town centres which would have been utilised by other mines during their construction phase. The primary access to and from the Project to Mudgee is assumed to be via Wollar Road. This road, which is currently unsealed and contains various narrow sections, is currently subject to road upgrades being undertaken by MWRC with funding by Resources for Regions. KEPCO understands that the schedule for these road upgrades has been substantially delayed from that originally anticipated. KEPCO is also concerned with public road safety during construction and inefficiencies (time and labour costs) of construction build due to long shift durations if the WAF is not constructed. The delays to this road upgrade provide further uncertainty to KEPCO in relation to accommodation availability and road safety within the Local Area (i.e. within a one-hour commute to the Project site), as in the absence of these road upgrades, Mudgee would be located outside of the Local Area.

These matters reinforce the uncertainty and risk identified by KEPCO in terms of accommodating the Project construction workforce within the Local Area compared to other mining developments.

As explained in Section 4.2.6 of the RTS, the construction and operation of the WAF will attract additional economic activity to the region when compared to the Project not having a WAF. Any potential accommodation capacity shortfall within the Local Area will likely result in economic costs to tourism and other activities whilst also potentially resulting in significant regional accommodation price rises. Avoiding these potential effects to the Local Area are economic benefits of the WAF.

DP&E has advised that an appropriate justification for the WAF is required with consideration of the MWRC policies and guidelines.

The WAF is proposed to be constructed on land zoned as RU1 Primary Production under the *Mid-Western Regional Local Environment Plan 2012* (Mid-Western Regional LEP). The proposed WAF falls within the definition of "temporary workers' accommodation" under the Mid-Western Regional LEP. Temporary Workers Accommodation is defined as '*any habitable buildings and associated amenities erected on a temporary basis for the purpose of providing a place of temporary accommodation for persons employed to carry out large-scale infrastructure, including development for the purposes of an extractive industry, mining, renewable energy or an electricity transmission or distribution network*'. Having regard to the provisions of Part 2 of the Mid-Western Regional LEP and the Land Use Table for RU1 Primary Production, the proposed WAF is a permissible land use with development consent under the Mid-Western Regional LEP.

Clause 6.11 of Part 6 of the Mid-Western Regional LEP provides a mechanism to enable the development for temporary workers' accommodation if there is a demonstrated need for such a facility. Clause 6.11 states:

> *"**6.11 Temporary workers' accommodation***
>
> *(1) The objectives of this clause are as follows:*
> *(a) to enable development for temporary workers' accommodation if there is a demonstrated need to accommodate employees due to the nature of the work or the location of the land on which that work is carried out,*
> *(b) to ensure that temporary workers' accommodation is appropriately located,*
> *(c) to ensure that the erection of temporary workers' accommodation is not likely to have a detrimental impact on the future use of the land or to conflict with an existing land use,*
> *(d) to minimise the impact of temporary workers' accommodation on local roads and infrastructure.*
> *(2) Development consent must not be granted to development for the purposes of temporary workers' accommodation unless the consent authority is satisfied of the following:*
> *(a) the development is to be located:*
> *(i) if the development relates to a mine—within 5 kilometres of the relevant mining lease under the Mining Act 1992, or*
> *(ii) in any other case—within 5 kilometres of the large-scale infrastructure in which persons are to be employed,*
> *(b) there is a need to provide temporary workers' accommodation due either to the large-scale infrastructure or because of the remote or isolated location of the land on which the large-scale infrastructure is being carried out,*

(c) the development will not prejudice the subsequent carrying out of development on the land in accordance with this Plan and any other applicable environmental planning instrument,
(d) water reticulation systems and sewerage systems will be provided to adequately meet the requirements of the development,
(e) when the development is no longer in use, the land will, as far as practicable, be restored to the condition in which it was before the commencement of the development.
(3) In this clause:

***temporary workers' accommodation** means any habitable buildings and associated amenities erected on a temporary basis for the purpose of providing a place of temporary accommodation for persons employed to carry out large-scale infrastructure, including development for the purposes of an extractive industry, mining, renewable energy or an electricity transmission or distribution network."*

The need for a WAF to accommodate the Project's employees was identified during the initial mine planning process and has been detailed within Section 3.11 of the EIS, Section 4.2.1 of the RTS and supporting technical reports. The Project is relatively remote from regional town centres (such as Mudgee) and recent studies have confirmed that there is insufficient accommodation available within the Local Area (i.e. within a one-hours commute from the Project site) to meet the forecast Project related accommodation demands.

The WAF is proposed on land which is immediately adjacent to and within 5 km from the Mining Lease Application(s) which were lodged in July 2015 for the Project. As explained within Section 3.11 of the EIS, the WAF has been designed to address social amenity considerations and assimilate with the Bylong Village.

As outlined within Section 3.11 of the EIS, at the point where the WAF is no longer required (as explained further below) the accommodation units will be decommissioned, infrastructure removed and the area will be reshaped and rehabilitated with grasses. Some ancillary infrastructure contained within the WAF (i.e. first aid facility and car parking facilities) will be retained for ongoing use throughout the life of the Project. The WAF will have its own water reticulation and waste water systems and will be decommissioned and rehabilitated at the point in time it is no longer required.

One of the objectives of the WAF is to provide suitable accommodation with the Local Area and therefore reduce travel times for construction personnel. Meeting this objective by utilising the proposed WAF will subsequently minimise impacts upon local roads and infrastructure. The location of the WAF, proximate to the mine site and the proposed use of busses between the WAF and the Project site also achieves this objective. Access to the WAF will be via an existing intersection with the Bylong Valley Way which is proposed to be upgraded for the Project.

Having regard to the above, the proposed WAF for the Project is consistent with the relevant objectives and requirements for Temporary Workers' Accommodation set out in the Mid-Western Regional LEP.

Section 6.2 of the MWRC's Development Control Plan (DCP) (MWRC, 2014) outlines the development standards, guidelines and criteria for the development of Temporary Workers' Accommodation within the MWRC LGA. Appendix A of the SIA (Appendix AC of the EIS) specifies where the relevant development standards, guidelines and criteria from this part of the DCP are addressed within the EIS. The description of the WAF for the Project as detailed within Section 3.11 of the EIS has been specifically designed to ensure that it meets the requirements of the DCP.

MWRC's submissions which do not support the WAF have not identified any inconsistencies of the WAF with the Mid-Western Regional LEP or DCP, but simply state (without any factual evidence) that the MWRC LGA has previously accommodated construction employees from other mines within the region. This is based on anecdotal evidence and KEPCO has yet to be provided with a contemporary survey based on factual data that can support MWRCs submissions. KEPCO is also concerned with public road safety during construction and inefficiencies (time and labour costs) of construction build due to long shift durations if the WAF is not constructed.

MWRC identified in its business papers for the Council meeting on 20 July 2016 that its decision to not support the approval of a WAF for the Project is consistent with Outcome 1 "*Looking After Our Community*", Goal 2 – "*Vibrant Towns and Villages*", Strategy 2.2 "*Manage Growth Pressures Driven by the Increase in Mining Operations in the Region*" of the MWRC Community Plan (MWRC, 2013).

As explained within Section 4.2.1.4 of the RTS, the analysis of the accommodation availability within the Local Area with the forecast accommodation demand for the construction phase of the Project has demonstrated that there is a shortage of longer term accommodation available (99 to 102 residences or 295 to 306 rooms) within the Local Area. This forecast in accommodation demand is a peak identified during the two year construction phase of the Project and is not considered a sustainable demand for the life of the Project. This peak demand occurs for a six to 12 month period of the construction phase of the Project. This is a substantial boom and bust scenario for the Local Area to cater for and to accommodate the short term construction workforce for the Project.

The RTS also identified that the short-term accommodation establishments noted during the survey that occupancy rates are generally at 100% during peak major events such as *A Day on the Green* (anytime between October-March) and *Mudgee Small Farm Field Days* (mid-July). This identifies the possibility that should the construction phase occur during these periods, either the workers or tourists will not be able to find suitable accommodation within the Local Area.

Hence, a conditional approval for a WAF within any Development Consent for the Project which requires KEPCO to demonstrate the need for this facility at the time is essential to provide certainty that the construction phase employees are able to be accommodated within the Local Area.

This certainty is an important consideration in KEPCO gaining the relevant internal approvals (from KEPCO Korea) prior to the commencement of the Project. Additionally, such a conditional approval avoids the situation where significant regional accommodation price rises occur over the construction phase and subsequently fall once the Project's demands have resided. This boom and bust situation which is likely to occur with no approval for a WAF for the Project is inconsistent with the intent of Outcome 1 "*Looking After Our Community*", Goal 2 – "*Vibrant Towns and Villages*", Strategy 2.3 "*Make available diverse, sustainable, adaptable and affordable housing options through effective land use planning*" of the MWRC Community Plan. That is, the growth which is required within the Local Area to satisfy the forecast shortfall in accommodation availability for the Project will not be sustainable (i.e. will only be for approximately six to 12 months) and will likely substantially increase rental prices within the local region over this period and place substantial pressures on housing affordability options.

In the meeting held with the MWRC's General Manager on 16 June 2016, it was acknowledged that there remains some uncertainty over the accommodation which may be available within the Local Area for the Project's longer term (three month plus) construction employees. As was discussed during this meeting, KEPCO prepared the following mechanism (draft condition of approval) for MWRC and DP&E's consideration which outlines the conditional approval of a temporary WAF of approximately 350 beds for the Project:

a. *"Prior to the commencement of construction, KEPCO will provide a justification report for the WAF to the satisfaction of the Secretary. The Report will:*

   i. *Incorporate the findings of an Accommodation Availability Survey to confirm both dwelling and individual room availability within the Local Area (i.e. a one-hours drive of the Project);*

   ii. *Confirm the construction workforce profile by month supported by a report from a suitably qualified person. This construction workforce profile will identify the anticipated local versus non-local hiring. The profile will also identify the short term (< 3 months) and long term (>3 months) non-local workers;*

   iii. *Confirm the number of accommodation units required within the WAF based on the comparison of the findings from the Accommodation Availability Survey and the construction workforce profile; and*

   iv. *Provide evidence that the Proponent has informed the MWRC of the number of accommodation units required within the Local Area and the WAF based on the above investigation.*

b. *Construct a sufficient number of modular accommodation units within the WAF to satisfy the shortfall in accommodation available within the Local Area (i.e. a one-hours commute of the Project) for the construction phase of the Project as determined within the WAF Justification Report;*

c. All accommodation units within the WAF will be decommissioned at the end of the construction Phase 1 (i.e. after 2 years of the commencement of the use of the WAF), or as otherwise agreed by the Secretary;

d. Update the Accommodation Availability Survey at the end of construction Phase 1 (i.e. no later than 2 years following commencement of WAF operation) to the satisfaction of the Secretary to confirm the continuing use of the WAF for PY 3 and PY 4. Otherwise, the WAF will be demobilised (excluding services) at the cessation of Construction Phase 1 (at 2 years following commencement of WAF operation);

e. Retain all servicing (including, but not limited to water, power, sewage facilities, first aid room, parking etc.) to the site of the WAF until around PY 4, with an option to re-instate the WAF for Construction Phase 2 in the event that cumulative mining and tourism demands result in a constrained accommodation market in the Local Area. A revised Accommodation Availability Survey is to be undertaken to inform the need or otherwise for a WAF for Construction Phase 2. This revised Accommodation Availability Survey is to be completed prior to the commencement of Construction Phase 2 (i.e. approx. or after end PY 4)

f. *Construct as required the first aid facility, bus drop off and pick up, car parking facilities, administration, fixed infrastructure and associated communication and utilities at the WAF site, to be utilised throughout the "Life of the Project."*

*(**Note:** the Local Area includes the township of Mudgee on the basis that Wollar Road Upgrade is completed prior to the commencement of construction. If the Wollar Road Upgrade is not completed in a timely manner (i.e. commencement of Construction Phase 1) then the WAF may be required to accommodate the full construction workforce)."*

This draft condition was considered and rejected by MWRC during the Ordinary Meeting on 20 July 2016.

KEPCO has only been provided with anecdotal evidence and has not been provided with any detailed analysis from MWRC regarding how they adopted the position to not support the proposed WAF for the Project. Further MWRC has not clearly been able to present KEPCO with a detailed schedule of the Wollar Road upgrade and specific completion date that would provide confidence to KEPCO that the construction phase would not be materially impacted.

WorleyParsons (on behalf of KEPCO) is continuing its detailed construction planning in parallel with the EIS assessment process leading up to the mines construction. This detailed planning will further inform both KEPCO and MWRC over what the demand for accommodation will be within the Local Area.

This information will be utilised in conjunction with the Accommodation Availability Surveys to determine the need for and the ultimate size of the WAF which may be required for the two year construction phase of Project.

Appendix D of the RTS presents a revised Traffic and Transport Impact Assessment (revised TTIA) for the Project. This revised TTIA included a scenario where there is no WAF available for the construction phase of the Project and concluded that the road network and associated intersections would continue to operate with ample capacity.

2.2 ROAD MAINTENANCE & UPGRADES

Issue 1

Council is continuing its discussions with Kepco in relation to the upgrades and ongoing maintenance of the local road network to accommodate the Bylong Coal Project.

Response

Noted. KEPCO met with the MWRC on 19 May 2016 and 29 June 2016 in relation to the proposed road maintenance contributions for the Project. During these meetings, KEPCO presented various offers to the MWRC for its consideration.

KEPCO's offers for road maintenance contributions to date have been based on the anticipated road maintenance costs proportionate to the Project's use of the regional road network within the MWRC LGA. KEPCO has also determined that any road maintenance contributions that are to be allocated by KEPCO to MWRC should take into account the value of the Voluntary Planning Agreement. KEPCO will continue to discuss the relevant road maintenance agreement with MWRC in this regard.

3. CONCLUSION

Having regard to the permissibility of the proposed WAF and its demonstrated compliance with the provisions of Clause 6.11 of the Mid-Western Regional LEP and supporting DCP, it is requested that DP&E consider as part of any development consent a conditional approval for a temporary WAF.

We trust this response addresses the issues raised in the MWRC submission to the extent possible at this point in time. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

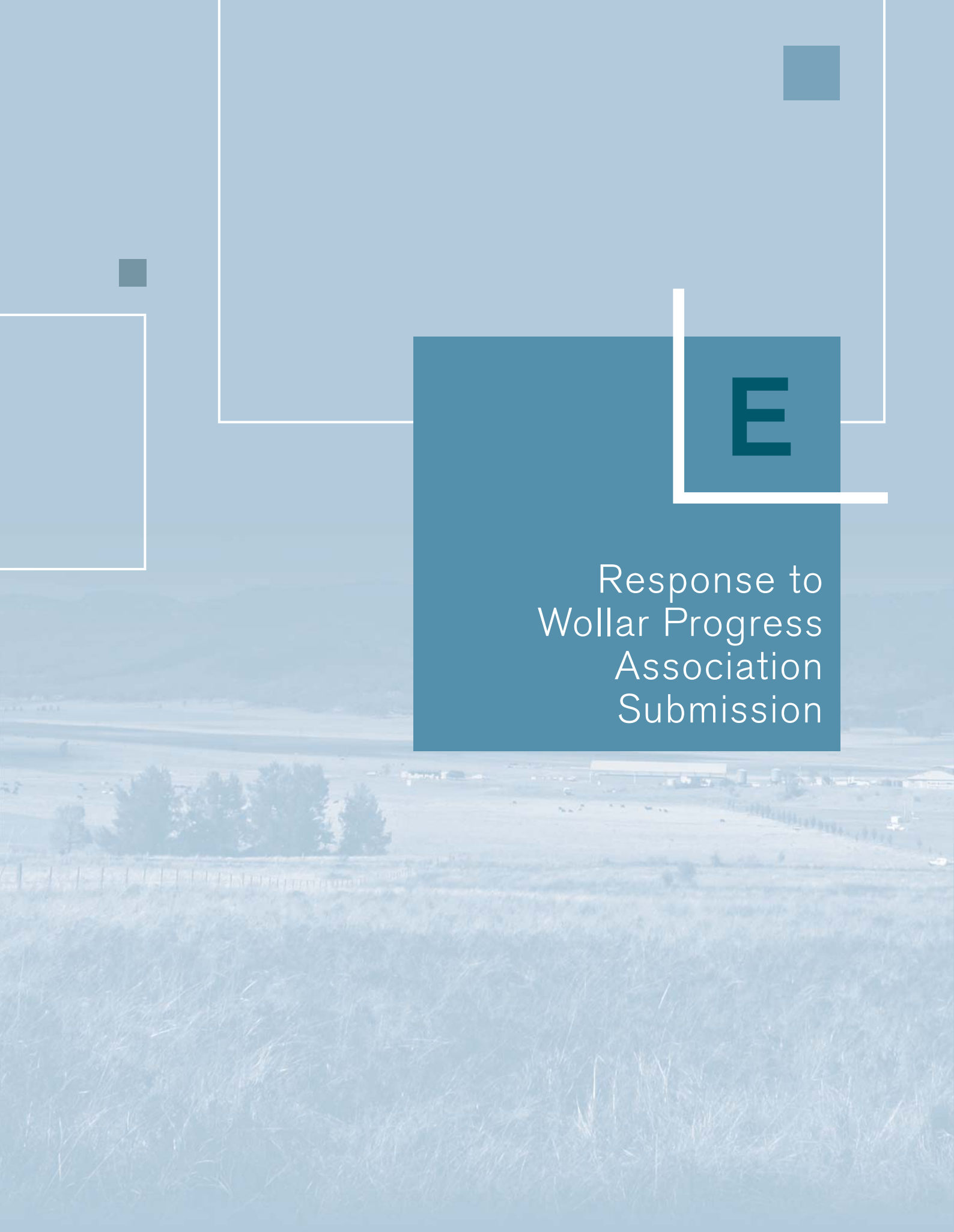
HANSEN BAILEY

Nathan Cooper
Senior Environmental Scientist

James Bailey
Director

E

Response to Wollar Progress Association Submission



BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

4 July 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to Wollar Progress Association Submission, Dated 26 April 2016

1. INTRODUCTION

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367.

This letter has been prepared to respond to the Wollar Progress Association's (WPA) letter dated 26 April 2016 to the Department of Planning and Environment (DP&E) regarding the RTS. The matters raised in the WPA's letter and KEPCO's responses to these issues are provided below.

2. RESPONSE TO THE WOLLAR PROGRESS ASSOCIATION'S SUBMISSION

2.1 TRAFFIC AND TRANSPORT

Issue 1 – Emissions Due to Rail Activities

Our submission stated that:

'Wollar Progress Association is concerned that the increase number of rail movements from the Bylong proposal, including a possible increase in the length of trains, will cause more trains from the three existing mines to sit idling in the Wollar rail loop. This lies immediately to the east of the village.'

'The cumulative impact of increased train movements on the Sandy Hollow railway line caused by the Bylong Coal Project has not been adequately assessed.'

The RTS response entirely misinterprets the issue by stating:

'The Project will not result in any additional trains on the Sandy Hollow to Gulgong Railway Line to the west of the Bylong Rail Loop and hence there will be no changes to air quality in the vicinity of the Wollar Village due to the Project.'

The Association is concerned that there has been no assessment of the increased period of time that trains from the Ulan, Moolarben and Wilpinjong mines will be sitting idling in the Wollar rail loop, waiting for train movements into and out of the Bylong Mine.

This issue has not been addressed.

Response

Australian Rail Track Corporation (ARTC) manages the train movements on the Sandy Hollow to Gulgong Railway Line which will be utilised by the trains associated with the Project. Trains on the Sandy Hollow to Gulgong Railway Line are currently constrained to a maximum length of 1,545 m. This maximum train length is dictated by the current capacity of the several passing loops which are located along the length of the Sandy Hollow to Gulgong Railway Line. The trains to be utilised for the Project will comply with ARTC's restrictions regarding train lengths. Therefore, the Project itself will not increase the length of trains utilising the Sandy Hollow to Gulgong Railway Line.

ARTC has considered the Project's train movements in its long term planning for the Sandy Hollow to Gulgong Railway Line. The Project will require an average of one to two train cycles per day at steady production. ARTC has advised that there are sufficient available paths on the Sandy Hollow to Gulgong Railway Line to accommodate the train movements generated by the Project.

WorleyParsons has advised based on its discussions with ARTC that there is sufficient surplus capacity on the Sandy Hollow to Gulgong Railway Line to minimise interruptions due to trains entering and departing the Bylong Rail Loop. As such, the Project is not expected to result in any material increase in idling times of trains on the Wollar passing loop and accordingly no additional air quality impacts are anticipated.

Issue 2 – Train Movements

> *The submission was referring to all rail loops along the Sandy Hollow to Gulgong Railway Line. The RTS refers only to assessment of noise levels and management of the Bylong Mine rail loop.*
>
> *The RTS refers to ongoing consultation with ARTC in relation to accommodating Project-related traffic on the Sandy Hollow to Gulgong Railway Line and that:*
>
> *'WorleyParsons has completed various rail operational assessment which has considered train idling times, tunnel ventilation times, increased noise levels and impacts to rail crossings on properties and on roads.'*
>
> *However, none of this information has been provided in the Revised Traffic and Transport Impact Assessment (RTS App D).*
>
> *The only reference to information from ARTC is in App B – a letter relating to train length and line capacity. An assessment of the impact of additional trains on the line has not been provided.*
>
> *Will the additional 'various rail operational assessment' be made available to the public?*

Response

ARTC requires all users of its rail network to comply with the noise limits imposed by its Environment Protection Licence (EPL 3142). The Project will utilise trains that comply with ARTC's requirements.

As explained in the response to **Issue 1** above, the Project is not expected to materially increase idling times on the Wollar Passing Loop. Furthermore, all trains idling on the Wollar Passing Loop are required to comply with the noise limits and other requirements within EPL 3142.

The Traffic and Transport Impact Assessment (TTIA) assumed tunnel ventilation times consistent with previous studies and current ARTC operating protocols. Impacts to level crossings and rail noise impacts would only occur to the east of the Project. No such impacts are anticipated to occur within the vicinity of Wollar village.

As explained in the response to **Issue 1** above, ARTC has determined that there is sufficient network capacity to accommodate the train movements associated with the Project.

Issue 3 – Road Safety

> *The revised traffic assessment suggests that 'a formal road safety audit be completed on the existing road conditions, in order to confirm the most appropriate road upgrade measures.' (App D p80)*
>
> *However, there is no indication of when this will occur or by whom. The Association considers that road safety is a critical issue for the Bylong Mine proposal that should not be pushed off until after the approval and considered while the mine is under construction.*

Response

The TTIA presented as Appendix Z of the EIS initially recommended that formal road safety audits of the road network should be prepared. Section 4.2.9.3 of the RTS indicated that the required road safety audits will be conducted prior to the commencement of construction.

In light of various submissions received on the RTS, Hansen Bailey engaged WSP Parsons Brinckerhoff on behalf of KEPCO to conduct the road safety audit of the current condition of the regional road network which is proposed to be utilised for the Project. The formal road safety audit report which addresses the commitment within the EIS and RTS will be provided in separate correspondence.

The key findings from the formal road safety audit include:

- General narrow road widths with no shoulder provision;
- Insufficient delineation due to the deficiencies in signage, line markings, edge lines and guideposts and reflectors;
- Road edge drop offs and damaged edge of pavement;
- Poor quality of road pavement including several patched sections on Bylong Valley Way, Upper Bylong Road and Wollar Road;
- Poor quality of pavement adjacent to the level railway crossing on Bylong Valley Way including pot holes and gravel tracking;
- Roadside hazards including large trees and culverts within the clear zone;
- Narrow road width under the rail bridge on Bylong Valley Way approximately 16 km east of the Wollar Road intersection;
- Steep sections of road on Bylong Valley Way between Bylong and Sandy Hollow and on Wollar Road;
- Minimal queue storage area for vehicles on roadway between the rail line and Upper Bylong Road (where the underground mine access is located); and
- Unfenced livestock on Lee Creek Road, Wooleys Road and Budden Gap Road.

KEPCO is continuing discussions with the relevant roads authority's in relation to road maintenance contributions for the Project. The roads authorities may decide to utilise road maintenance funding to assist with the remediation of these road safety risks.

Issue 4 – Road Traffic Noise

> *The RTS indicates that 'the majority of Project related traffic is proposed to travel along Wollar Road to and from Mudgee, with a minor proportion potentially utilising Ulan-Wollar Road from Wollar village.'*
>
> *It is predicted that a maximum of 230 vehicles per hour in peak hour could travel through Wollar with an increase of approximately 478 vehicles per day.*
>
> *The social, noise and safety impacts of this massive increase of up to 600% in daily traffic movements has not been assessed.*

Response

The *Bylong Noise Report Addendum* (Pacific Environment, 2016) (Appendix F of the RTS) considered the potential noise impacts associated with road traffic generated by the Project. The main route for traffic travelling from the Project towards Mudgee is anticipated to be via the entire length of Wollar Road to Ulan Road. Wollar Road travels through the southern outskirts of the Wollar Village. The road noise assessment considered the anticipated road traffic noise along Wollar Road. Wollar Road is classified as a sub-arterial road.

The *Road Noise Policy* (RNP) (DECCW, 2011) prescribes criteria for the assessment of road traffic noise. The RNP provides that a development should not result in road noise levels greater than 12 dBA above existing day or night time noise levels. The RNP also provides that the cumulative noise level at residences located along sub-arterial roads should not exceed 60 dBA for the day period or 55 dBA for the night period.

Noise modelling has demonstrated that both the increase in noise level and cumulative noise level are predicted to be within the criteria prescribed by the RNP.

Issue 5 – Oversized Traffic

> *The revised traffic report states that:*
>
> *'Oversized vehicles will need to travel to the Project site via Wollar Road due to an overhead rail bridge on Bylong Valley Way east of Wollar Road and the general steep terrain and tight horizontal curves on Bylong Valley Way'.*
>
> *The report does not identify whether the oversized vehicles will travel the entire length of Wollar Rd or along Ulan-Wollar Rd through Wollar village and onto Wollar Rd to Bylong Valley Way.*
>
> *While the Wollar Rd through the Munghorn Gap Nature Reserve is a designated B-Double road, the revised traffic report has identified existing safety deficiencies including steep sections of road on Wollar Road east of Wollar and through Munghorn Gap Nature Reserve (App D 2.13 p38). This route is not suitable for oversized and overmass vehicles.*

The Association is aware that Mid-Western Regional Council has applied for Royalties for Regions funding to upgrade the Wollar Rd east of Wollar. However, there is no guarantee that this will be successful or timely in relation to the requirements of oversized and overmassed vehicles delivering construction materials to Bylong Mine.

The Association assumes that these large vehicles are likely to travel through Wollar village from the Ulan-Wollar Rd. This impact has not been assessed.

Likewise for the route of transport of dangerous goods including explosives, emulsions, diesel, various gases and other hydrocarbons (App D 5.14 p68). There is no indication provided about the route for dangerous goods.

The Association considers that the issue of safety and amenity of Wollar village has not been addressed.

Response

All oversized and overmass vehicles will travel to the site via Wollar Road (Wollar to Mudgee Road) from Ulan Road. This has been identified as the most suitable route for the Project's oversized and overmass vehicles given that it is a designated B-Double route. Oversized and overmass vehicles for the Project will not use the Ulan-Wollar Road which has various unsealed sections and also travels through the more populated areas of Wollar Village.

As explained in Section 5.22.3 of the RTS, the majority of Project related traffic is proposed to travel along Wollar Road to and from Mudgee, with a minor proportion of light vehicles potentially utilising Ulan-Wollar Road. The results of the revised TTIA (Appendix D of the RTS) indicates both the road network and associated intersections within and surrounding Wollar village have ample capacity to accommodate the increased road traffic generated by the Project.

Road condition and public safety will be monitored during the mine construction and operation stages in close consultation with the MWRC.

The *RMS Guide to Traffic Generating Developments* (October 2002) further describes traffic related impacts on residential streets. Table 4.6 of this document looks at environmental capacity standards on residential streets and takes into both public amenity and safety considerations. Based upon Table 4.6 of this RMS document, a Local Street could accommodate a maximum 300 vehicles per hour in a peak hour and likewise a Collector Street could accommodate a maximum 500 vehicles per hour in a peak hour. Under cumulative traffic conditions during construction in 2017, the Projects peak traffic year, there is a maximum 203 vehicles per hour through this intersection within a peak hour which is well within RMS environmental capacity performance standards.

Transportation of dangerous goods to the site throughout the life of the Project will be conducted in accordance with the *Dangerous Goods (Road and Rail Transport) Regulation 2014*.

Procedures and processes associated with the transportation of dangerous goods will be detailed in the Hazard Management Plan prior to the commencement of construction. The necessary safety precautions will be implemented including the use of suitable transportation vehicles and personnel.

2.2 SOCIAL

Issue 6 – Decline in Population of Wollar

> *The RTS incorrectly states that 'The population decline experienced in Wollar SS between 2001 and 2006 is unlikely to be a result of cumulative mining expansion in the area.'*
>
> *The acquisition of property for the Wilpinjong Mine commenced in 1998 with the purchase of Cumbo Station by agents for Excell prior to the exploration licence being granted in 2003.*
>
> *The acquisition of property on the Bungulla estate continue during the assessment period of the proposed mine and the entire area had been acquired by the time approval was granted in February 2006.*
>
> *This included a substantial number of families, including children attending Wollar Public School, and active members of community organisations including Church congregations. The downturn of business at Wollar General Store commenced during this time.*
>
> *We consider that the incorrect information provided in the KEPCO RTS may be a result of the inadequate SIA provided for the Wilpinjong extension project.*
>
> *This will need to be addressed in the peer review being conducted by Elton Consulting.*
>
> *The cumulative social and environmental impact of mining in the region has been significant since the commencement of the Ulan Mine in 1985. It is misleading for KEPCO to be stating otherwise.*

Response

The Social Impact Assessment (SIA) (Appendix C of the RTS) conducted an assessment of population change based on both qualitative and quantitative data available at the time the SIA was completed (Section 6.3.1 of Appendix C of the RTS). This assessment included information presented within the *Wilpinjong Expansion Project – Social Impact Assessment* (Elliott Whiteing, 2015) and other sources in relation to the population decline experienced within the Wollar Village. KEPCO acknowledges that land purchases within this region by mining companies occurred prior to 2006.

The SIA states unequivocally that the significant population decline post 2006 in Wollar Village is due to the cumulative impacts of mining (Section 6.3.1 of Appendix C of the RTS). The SIA also acknowledges that there is little potential for any significant population growth in Wollar Village into the future.

KEPCO understands that the peer review of the SIA being referred to in the WPA submission is the review which has been commissioned by DP&E. KEPCO will consider the recommendations of the peer review once it has been provided by DP&E.

3. CONCLUSION

We trust this response addresses the issues raised in the WPAs submission. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

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Response to Muswellbrook Shire Council Submission

7 July 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to Muswellbrook Shire Council Submission

1. INTRODUCTION

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application State Significant Development (SSD) 14_6367.

Due to the time of receipt of Muswellbrook Shire Council's (MSC) comments (letter dated 15 March 2016), the comments were not able to be addressed in the RTS. As such this letter addresses MSC's comments. This letter has also been informed by discussions held during a meeting with the MSC on 26 May 2016.

2. RESPONSE TO MSC SUBMISSION

2.1 GENERAL TRAFFIC IMPACTS & ASSUMPTIONS

Issue 1

The Proponent's Traffic and Transport Impact Assessment has been prepared on the assumption "that there will be no heavy vehicles using the Bylong Valley Way". It notes that service and delivery vehicles are "most likely to travel from Sydney, Newcastle and Muswellbrook (either on Golden Highway and Ulan Road and Wollar Road or along Bylong Valley Way to the east) then from Mudgee (along Wollar Road to the north-west)". This is not thought to be true.

Response

As noted within the Traffic and Transport Impact Assessment (TTIA) which formed Appendix Z of the EIS, services and deliveries from the east of the Project site are most likely to travel from Sydney, Newcastle and Muswellbrook either on Golden Highway, Ulan Road and Wollar Road or along Bylong Valley Way from the east.

However, the intersection and mid-block capacity modelling completed for the TTIA (Appendix Z of the EIS) did assume a small percentage of heavy vehicle (as per the Austroads Vehicle Classification System) traffic on the Bylong Valley Way from the Project, as noted within Sections 4.7.2 and 4.7.3 of the TTIA. These numbers were:

- Construction Phase:
  - Construction employee workforce light vehicles – 5% to/from the east (Sandy Hollow, Denman); and
  - Construction and service vehicles – 10% to/from the east (Sandy Hollow, Denman);
- Operational Phase:
  - Operational employee workforce light vehicles – 5% to/from the east (Sandy Hollow, Denman); and
  - Operational contractor and service vehicles –10% to/from the east (Sandy Hollow, Denman).

The comment in Figure 4.1 of the TTIA stating ‘no heavy vehicles’ on Bylong Valley Way east of Wollar Road was in error, as heavy vehicles have been modelled on this section of road in the TTIA.

Section 4.12 of the TTIA identified that oversize or over-mass vehicles will need to travel via Wollar Road due to the overhead rail bridge on Bylong Valley Way east of Wollar Road and the general steep terrain and tight horizontal curves on Bylong Valley Way (both south and east of the Project site).

Oversize vehicles are those vehicles over 19 m long, 2.5 m wide or 4.3 m high. Over-mass vehicles are those where the vehicles gross mass is over 42.5 tonnes.

Having regard to the above, some Project-related heavy vehicles (that comply with the relevant road restrictions) will utilise Bylong Valley Way from the east. The traffic modelling undertaken for the TTIA was based on a worst case scenario with an assessment of impacts from heavy vehicles and other Project-related traffic on the surrounding road network and associated intersections including Bylong Valley Way.

As concluded within Sections 5.2 and 5.4 of the TTIA, this worst case assessment did not identify any substantial implications to the capacity of the regional road network including Bylong Valley Way or on intersection performance (at the Bylong Valley Way and Golden Highway intersection).

Issue 2

> *It is noted that the Proponent has not provided a current traffic assessment with respect to predicted impacts of the Project on the Bylong Valley Way. Council is responsible for the maintenance of the Bylong Valley Way from its eastern end at Sandy Hollow on the Golden Highway to within 15 km of the proposed Project site.*

Response

Section 7.18.2 of the EIS defines the Local Area as the locations within a one hour drive of the Project site (i.e. Mudgee, Wollar, Ulan, Rylstone, Kandos, Sandy Hollow and Denman). This is considered to be the likely and safe commute time for employees. This definition of Local Area was based on the assumption that Wollar Road would be upgraded by the end of Project Year 1 (i.e. was assumed by the end of 2016) under the Resources for Regions funding, placing Mudgee within an acceptable travel time.

During the initial planning work undertaken in 2013 and 2014 for the Project, the above assumptions were utilised to investigate the availability of employees and accommodation within the Local Area. This planning work was undertaken in close consultation with the MWRC (being the applicable Local Government Area (LGA)) to determine the most appropriate place of residence for the Project's employees. At this time, the accommodation availability and available workers at the localities within the MSC LGA (i.e. Denman and Sandy Hollow) were minimal and were heavily influenced by the wider mining industry.

A reasonable worst case distribution of Project-related employees was determined and is explained in Section 4.7 of the TTIA. These distributions were included in the traffic modelling scenarios of the key intersections within the study area and were reported in the EIS. These distributions assumed that 5% of the construction and operational workforce would travel to and from the Project site via Bylong Valley Way to the east. KEPCO is aware that MSC is the appropriate roads authority for the 40 km section of Bylong Valley Way to the east of the Kerrabee Range.

Section 2.1 of the TTIA identifies the traffic volumes (Annual Average Daily Traffic (AADT)) recorded in 2011 on the Bylong Valley Way to the east of the Project site as approximately 418 vehicles per day, with 13% of these being associated with heavy vehicles. This is equivalent of 462 vehicles per day in 2016 numbers, based on the application of a conservative traffic growth increase of 2% per annum. Section 2.3 of the TTIA provides the intersection traffic counts for the weekday morning and afternoon peak hours as the basis for the TTIA.

It is noted that the AADT data referenced within the TTIA is generally consistent with MSCs historical traffic count data which was provided to Hansen Bailey on 2 June 2016. The range in MSC's AADT road traffic data for locations on Bylong Valley Way to the east of the Project is between 321 vehicles per day (in March 2010) and 536 vehicles per day (in November 2008), averaging 439 vehicles per day based on the ten measurements between November 2008 and September 2014.

Having regard to comments raised by stakeholders on the EIS TTIA, the RTS included a revised Traffic and Transport Impact Assessment (revised TTIA) (Appendix D of the RTS) which considers a regional study area, as opposed to the more localised study area considered in the EIS. The revised TTIA includes consideration of roads and associated intersections more than 60 km away from the Project site.

Intersection surveys completed for the revised TTIA in December 2015 on the Golden Highway and Bylong Valley Way intersection indicated morning peak hour between 11:00 am and
12:00 pm and afternoon peak hour between 12:00 pm and 1:00 pm. The results of these intersection surveys indicate that this intersection is operating at a good level of service (Level of Service A) with adequate spare capacity.

Section 5.8.3 of the revised TTIA assessed a modified distribution of operational employees on the road network, assuming that during the open cut and underground operations between 6-7% of employees would utilise the Bylong Valley Way to/from the east. The percentage of construction and service vehicle trips along this route remained at 10%, consistent with the EIS TTIA. The revised TTIA concluded that the performance of the Golden Highway and Bylong Valley Way intersection with the Project-related traffic would continue to operate with good levels of service with adequate spare capacity.

Section 6.4 of the revised TTIA also confirms that road mid-block capacities and intersection performance on Bylong Valley Way will continue to perform well within capacity with the introduction of Project traffic.

Issue 3

Based on the Proponent's EIS and supporting Traffic and Transport Impact Assessment (Appendix Z) it is noted that:

a) Section 1.6 in Appendix Z contains a traffic assessment for 2 intersections in Bylong, within the Project area. Council is not able to find a traffic survey for the Bylong Valley Way east of the Project. Any potential impact on the Bylong Valley Way could not be assessed. Should traffic increase as a result of this development, Council has no base line data of traffic type and numbers upon which to assess any future changes.

Response

Noted. As explained in the response to Issue 2 above, in light of concerns raised by agencies and other stakeholders during the exhibition of the EIS, the RTS includes a revised TTIA (Appendix D of the RTS) which assessed the regional road network, including roads and associated intersections more than 60 km away from the Project site.

Sections 5 and 6 of the revised TTIA provide the relevant assessment of Project-related traffic on the Bylong Valley Way to the east. This assessment has confirmed that the road network will continue to operate with a good level of service with regards to mid-block capacity (on the Bylong Valley Way) and intersection capacity (at the Bylong Valley Way and Golden Highway intersection) with adequate spare capacity.

Issue 4

b) Section 3.12 (P73) in the project EIS states that "it is anticipated that following the initial construction period and into operations phase that the majority of the project employees will reside in Mudgee or within the wider MWRC LGA [(Mid-Western Regional Council Local Government Area)]." The document is silent on where the construction workforce will come from, although a camp is to be offered to accommodate construction workers. Further to this in Section 7.18.3 (P320), the EIS states that 90% of the operation workforce will reside in Mudgee. It does not provide justification for this, or use the sourcing locations of the workforce from nearby mines to support this. As the Bylong proposal is located closer to the Hunter and Newcastle than existing mines it can be expected that staff not residing in Mudgee will be higher for the Bylong project than for existing mines.

Response

As outlined in the response to Issue 2 above, the Local Area was defined in the EIS as areas within a one hour drive of the Project site (i.e. Mudgee, Wollar, Ulan, Rylstone, Kandos, Sandy Hollow and Denman), which is considered to be a safe commute time for employees.

This was also on the assumption that the Wollar Road upgrade (via Resources for Regions funding) would place Mudgee within an acceptable travel time.

Section 4 of the TTIA and the revised TTIA outlined the sensitivity options analysed for impacts on the road network and were based on the scenarios within the Social Impact Assessment (SIA) (Appendix AC of the EIS). Section 4 of the SIA provides the rationale behind the distribution of traffic from the Project site during the construction and operations scenarios.

Other towns/localities beyond the Local Area were considered to be too distant from the Project site to permanently accommodate employees involved in the construction and/or operations phases. Localities within the Local Area to the east of the Project site (i.e. Denman and Sandy Hollow within the MSC LGA) were identified to have some limited availability in accommodation or the ability to expand beyond current capacity.

In response to comments raised during the public exhibition of the EIS, the RTS included a Workforce Accommodation Study (Appendix E of the RTS) and a revised Social Impact Assessment (revised SIA) (Appendix C of the RTS). The Workforce Accommodation Study reported on updated information regarding the accommodation available within the Local Area.

The Workforce Accommodation Study identified an increase in both short term and longer term accommodation available within the township of Denman compared to the assessment identified within the original SIA. This was attributed by the survey respondents to be a direct reflection of the current downturn being experienced in the Hunter Valley mining industry.

KEPCO continues to foresee and supports that the majority of the workforce will reside within the MWRC LGA within the townships of Mudgee, Rylstone and Kandos. Whilst some of the workforce may reside to the east within the townships of Denman and Sandy Hollow, this is likely to be a small proportion of the overall workforce. In light of the downturn experienced within the Hunter Valley mining industry, the revised TTIA has provided an updated distribution of employees travelling to and from the Project site from the east, from Denman and Sandy Hollow.

Issue 5

c) *The EIS is dismissive of the large supply of equipment and personnel currently located in the Newcastle and Hunter. Newcastle and the Hunter provide a comprehensive range of mine support services. It could be reasonably expected that this resource will be called upon to open the new mine. The shortest and quickest road trip to the proposed site from the Hunter or Newcastle is on the Bylong Valley Way. Further, with the current downturn in mining it is reasonable to expect that these suppliers will offer very competitive offers to KEPCO. A recent downturn in mining has led to a number of mining employees being laid off in local mines. It can be expected that many of those former mining employees*

would secure employment at the proposed mine at Bylong and that many would commute each day to the Bylong mine site.

It should be noted that Denman is closer to Bylong than Mudgee, the town identified in the EIS as being the major location for the accommodation of mine employees.

For these two reasons the proposal can be expected to increase both heavy and light vehicle traffic on Bylong Valley Way, which is disregarded by the Proponent's EIS.

Response

The Project planning and design and the preparation of the EIS and associated environmental assessments has been an ongoing process undertaken over a number of years (commencing in 2010 following KEPCO's acquisition of the Project). Over this time and largely as a result of the downturn in the mining industry, there has been a substantial change in the availability of employees and the availability of accommodation within the Local Area.

During initial planning work (throughout 2012, 2013 and 2014), it was envisaged that employees would need to be sourced largely from non-local hires. With the downturn in the mining industry experienced since this time, it is now accepted that there is a greater availability of workers within the Local Area.

Whilst Denman and Sandy Hollow are located closer to the Project site than Mudgee, KEPCO consider that Mudgee is likely to accommodate a substantial portion of the Project workforce. Denman and Sandy Hollow may provide a suitable place of residence for some of the Project workforce which will result in additional light vehicles utilising Bylong Valley Way to the east. The TTIA and revised TTIA do assess a proportion of the workforce to travel to and from the Project site via the Bylong Valley Way to the east. Should these proportions of Project-related traffic increase beyond that assessed, it is anticipated that the road network will still operate with good levels of service and that spare capacity will be available on the local road network.

The mining support services and equipment providers within the Hunter Valley are generally located within townships outside of the Local Area and beyond the KEPCO required one hour commute from the Project (i.e. Muswellbrook and Singleton). Whilst it is acknowledged that some mining support services and equipment providers will be utilised from the Hunter Valley for the Project, it should be noted that the majority of specialist support services required by mining operations are available from within the MWRC LGA. Further to this, KEPCO will encourage the mining support services and equipment providers which are located beyond the Local Area to establish a base within the Local Area to enable acceptable travel times to and from the Project. Despite this, the revised TTIA has assumed that 10% of such services will be provided from the Hunter Valley area.

Section 6.4 of the revised TTIA states that given the low amount of traffic generated by the Project over a daily and peak hourly period, and given the existing low volumes of traffic, only minimal impacts are foreseen on the surrounding road network.

Road mid-block capacities and intersection performance on Bylong Valley Way, Upper Bylong Road and Wollar Road will continue to perform well within capacity with the introduction of Project traffic.

Issue 6

d) The impact of heavy vehicles on Bylong Valley Way which will arise from this proposal are of significant concern to Council. Heavy vehicle cause significantly more damage to the road surface than light vehicles. Many sections of the Bylong Valley Way are narrow and winding with corners offering poor visibility. The use of this road by trucks will increase the risk of accidents to all road users. Cox's Gap, located on Council's western boundary, is steep and very winding. Longer trucks and articulated vehicles are unable to use this road without crossing the centre line on a number of bends. Whilst it currently has no restrictions, it is not suitable for large volumes of heavy vehicles.

Response

The road constraints for heavy vehicles on the Bylong Valley Way identified by MSC have similarly been identified within the TTIA and revised TTIA. However, as explained in Section 1.7 of the revised TTIA, "*Semi-trailers were observed using Bylong Valley Way (with a number to and from Bylong Quarry) …*".

In light of the road constraints identified, KEPCO confirms that the majority of heavy vehicles (particularly those longer heavy vehicles that would be restricted by the narrow road widths, steep winding road sections and the rail overpass to the east of the Project) will utilise the Golden Highway, Ulan Road and Wollar Road to access the Project. This has also been confirmed in KEPCO's discussions with MWRC regarding the impending upgrade and mitigation strategies to protect the planned Wollar Road (Resources for Region) sealing and road works.

KEPCO acknowledges the shorter and more direct route to the Project via Bylong Valley Way. However in light of the known road constraints for the oversize and over-mass heavy vehicles on the Bylong Valley Way, KEPCO and its future EPC contractor will require the drivers of oversize or over-mass heavy vehicles (particularly the longer vehicles) travelling from the east to utilise the Golden Highway route to minimise the potential safety risks to other road users on the Bylong Valley Way. KEPCO will require the drivers of Project-related oversize or over-mass heavy vehicles to prepare Journey Management Plans to ensure compliance with this commitment.

Issue 7

e) *The Proponent has not offered any road use restrictions or compensation to Council with respect to the Bylong Valley Way. Section 6.4 (P66) of Appendix Z includes an offer to enter into a Voluntary Planning Agreement (VPA) with Mid-Western Regional Council but not Muswellbrook Shire Council. The EIS provides no existing traffic volume numbers for the Muswellbrook Local Government Area section of Bylong Valley Way. The closest reference provided in Table 96 (P322) is an indicated 63% increase in traffic on the intersection of the Bylong Valley Way and Wollar Road.*

Further the EIS does not offer any future traffic assessment to determine if traffic number changes eventuate. The EIS does not offer any restrictions to the travel path of any vehicles to the project site.

Response

KEPCO has been advised by DP&E that as the Project is located within the MWRC LGA, a Voluntary Planning Agreement (VPA) for the Project should be discussed and negotiated with the MWRC. This VPA has on the 18 May 2016 been exhibited and reported back to the MWRC. The VPA was formally signed by MWRC and KEPCO on the 22 June 2016. Whilst it is acknowledged that there may be some Project-related use of and impacts to the 40 km section of the Bylong Valley Way which occurs within the MSC LGA, the anticipated impacts from KEPCO's evaluation have been assessed to be low or insignificant.

As discussed with MSC during meeting on the 26 May 2016, KEPCO does not consider a VPA with MSC is required for the Project.

It was acknowledged during the meeting that according to the traffic predictions within the revised TTIA, the anticipated usage of Bylong Valley Way by Project-related vehicles during the operational years of the Project would be minimal. Accordingly, it was recognised that a specific road maintenance contribution for usage may not be warranted. However, MSC requested that KEPCO commit to regularly monitoring of Project-related traffic to validate the assumptions made within the revised TTIA.

MSC identified as a priority over ongoing road maintenance that there are a number of known safety issues on the Bylong Valley Way which require attention and that even a small additional contribution to road traffic would exacerbate these. MSC therefore highlighted that they are focussed on requiring a contribution from KEPCO to assist in the remediation of particular road safety risks.

In consideration of this concern, KEPCO is committed to the following items in relation to contributions to MSC which were discussed during the meeting:

- Road dilapidation inspections to be conducted prior to the commencement of construction activities and at the end of Project Year (PY) 2 of construction (this is where the Project is likely to result in atypical additional heavy vehicle traffic usage). Based on the results of the 'before' and 'after' dilapidation inspections, KEPCO would make a 'payment for damage' contribution to MSC for any identified Project-related road damage caused by the construction activities that go beyond normal wear and tear;
- KEPCO proposes to make a financial contribution to assist MSC in the remediation of the road delineation and road signage issues (as recently identified within the Road Safety Audit) on its 40 km section of Bylong Valley Way prior to construction phase 1. This proposed financial contribution will be proportionate to the predicted increase in traffic movements on this section of Bylong Valley Way as a consequence of the Project; and
- Conduct road traffic flow counts and monitoring of residential location of employees at various stages throughout the life of the Project (i.e. PYs 2, 9 and 13) to validate the assumptions made within the revised TTIA in relation to distribution of Project-related traffic across the road network.

The revised TTIA has modelled an indicative 26 light vehicles per day for the PY 2 (Construction) and PY 9 (Dual Operations) scenarios and seven vehicles per day in PY 13 (Underground only) on Bylong Valley Way, between Wollar Road and Golden Highway intersection. The revised TTIA has also modelled an indicative 10 heavy vehicles per day for the PY 2 (Construction) scenario, and two vehicles per day for the PY 9 (Dual operations) and PY 13 (Underground only) scenarios on Bylong Valley Way, between Wollar Road and Golden Highway intersection. Based on the Project Year scenarios modelled in the revised TTIA, Project-related traffic flows will contribute an average of 6.3% and 4% to the background traffic flows for light and heavy vehicles respectively.

As discussed above, it is not currently proposed by the relevant regulatory authorities to outright restrict oversize or over-mass vehicles from utilising the Bylong Valley Way as part of the public regional road network. However, KEPCO and its EPC Contractors will require the drivers of oversize or over-mass heavy vehicles travelling from the east to formulate a Journey Management Plan which utilises the Golden Highway, Ulan Road and Wollar Road route to the Project.

2.2 SUGGESTED DEVELOPMENT CONSENT CONDITIONS

MSC has provided some suggested Development Consent conditions, should the Project be approved. A response to each suggested condition is provided below.

2.2.1 Suggested Condition 1

Prior to the commencement of the development the Proponent undertake a Road Safety Audit of Bylong Valley Way to determine if improved delineation and warning signage together with some curve widening is required to manage the expected increase in traffic volume.

2.2.2 Response

KEPCO supports this recommendation to the extent that it has recently completed a Road Safety Audit of Bylong Valley Way KEPCO proposes to make a financial contribution to assist MSC in the remediation of the road delineation and road signage issues (as recently identified within the Road Safety Audit) on its 40 km section of Bylong Valley Way prior to construction phase 1. This proposed financial contribution will be proportionate to the predicted increase in traffic movements on this section of Bylong Valley Way as a consequence of the Project.

KEPCO proposes to undertake dilapidation inspections of the 40 km section of Bylong Valley Way in consultation with MSC before and after Project-related construction activities. Based on the results of these 'before' and 'after' dilapidation inspections, KEPCO would make a 'payment for damage' contribution to MSC for any damage identified to the road beyond normal wear and tear which is the direct result of Project-related road construction activities.

A Road Safety Audit of the road network to be utilised by the Project (including the section of Bylong Valley Way within the MSC LGA) has recently been undertaken by Parsons Brinckerhoff to identify the current road safety issues. The Road Safety Audit is currently in the process of finalisation and will be included within the Supplementary Response to Submissions (Supplementary RTS) report.

For the section of Bylong Valley Way within the MSC LGA, the Road Safety Audit identified various deficiencies on the existing road network. These include deficiencies relating to road alignment, roadside hazards, road delineation and signage.

As discussed during the meeting with MSC on 26 May 2016, the anticipated negligible increase in traffic volumes on the Bylong Valley Way as a result of the Project will not materially change the deficiencies identified within the Road Safety Audit on the existing road network. Notwithstanding this, KEPCO is committed making a contribution to assist MSC with the remediation of the road delineation and road signage issues, prior to construction phase 1, which have been identified within the recently completed Road Safety Audit, proportionate to the identified increase in traffic movements as a consequence of the Project. This funding will be provided on the basis that the remaining costs for the remediation of the identified road safety risks on the Bylong Valley Way within the MSC LGA, including road alignment and roadside hazards would be the responsibility of MSC.

2.2.3 Suggested Condition 2

Prior to the commencement of the development the Proponent conduct a traffic survey at or around Cox's Gap on a number of non-consecutive days to assess existing traffic numbers and the component of heavy and light vehicles within the traffic flow. This assessment should also include what could be considered to be mine vehicles presumably accessing existing mines.

2.2.4 Response 2

The revised TTIA includes some additional road traffic flow information at the Bylong Valley Way/Golden Highway intersection which identifies the light and heavy vehicle contributions. KEPCO accepts the request to complete a traffic survey (mid-block counts) prior to the commencement of construction activities at the location specified by the MSC in its submission.

The proposed traffic surveys will be conducted over two non-consecutive seven day periods prior to the commencement of construction. The traffic flow data gained during these surveys will be utilised in comparison with previous traffic flow data on Bylong Valley Way held by MSC to determine the existing traffic numbers and the component of heavy and light vehicles within the traffic flows recorded.

The assessment will also attempt to identify existing mine related service vehicular traffic on the Bylong Valley Way. However, this will be difficult to accurately determine.

2.2.5 Suggested Condition 3

Provide for a restriction in the use of Bylong Valley Way by long and heavy vehicles. Traffic use should be prohibited to vehicles over 19 m long and 3 m wide.

2.2.6 Response 3

KEPCO supports this recommendation and will update its management and mitigation commitments to include "*Project traffic with vehicles over 19 m long and 3 m wide shall be required not to utilise Bylong Valley Way from the east (i.e. Sandy Hollow) given the narrow and tight horizontal curves of sections of this road.*" KEPCO will require the drivers of vehicles over this size range to travel via the Golden Highway, Ulan Road and Wollar Road.

In an emergency situation, KEPCO will notify the relevant road's authority (i.e. MSC and MWRC) when vehicles over this size range will utilise Bylong Valley Way to the east. This commitment will be outlined within the Construction Traffic Management Plan to be prepared for the Project.

2.2.7 Suggested Condition 4

The Proponent undertake negotiations with Muswellbrook Shire Council with a view to entering into a VPA to address the expected increased maintenance costs for Bylong Valley Way. This could be based on an annual agreed fee or a fee based on a change in traffic numbers over an agreed base line number.

2.2.8 Response 4

As indicated above, KEPCO does not seek to enter into a VPA with the MSC for the purposes of road maintenance contributions. It was acknowledged in a meeting with MSC on the 26 May 2016 that the anticipated minimal usage of Bylong Valley Way by Project-related traffic does not warrant the need for annual road maintenance contributions. However, MSC has identified other areas within which contributions are sought from KEPCO.

As discussed during the meeting with MSC, KEPCO alternatively makes the following commitments for inclusion in any Development Consent which may be granted over the Project:

1. KEPCO will make a 'payment for damage' contribution to MSC for any identified road damage caused by the Project's construction activities that goes beyond normal wear and tear. This contribution will be pro-rated based on the verified usage of Bylong Valley Way by Project-related vehicles (determined by Journey Management Plans and monitoring of Project-related traffic in PY 2) and on the results and analysis of road dilapidation inspections which will be undertaken 'before' and 'after' the construction phase of the Project. The process to verify the 'payment for damage' contribution will be described within the Construction Traffic Management Plan.

2. KEPCO will make an offer of a funding contribution to MSC to assist with the remediation of the road delineation and signage road safety issues identified within the recently completed Road Safety Audit based on the anticipated pro-rata usage of the road by Project-related traffic during steady state operations.

3. KEPCO will monitor Project-related traffic at specific stages throughout the life of the Project (for example, PY 2 (Construction Phase 1), PY 9 (Dual Operations) and PY 13 (Underground only)) to verify the assumptions utilised within the revised TTIA and report the findings of these surveys in the relevant Annual Reviews.

3. CONCLUSION

The TTIA completed for the EIS considered the road network in the localised study area, surrounding the Project. In light of queries identified by stakeholders on the EIS TTIA, the RTS included a revised TTIA (Appendix D of the RTS) which considers a wider, regional study area. The revised TTIA includes a consideration of roads and associated intersections more than 60 km away from the Project, including Bylong Valley Way to the east.

Sections 5 and 6 of the revised TTIA modelled an indicative maximum of 26 light vehicles per day and 10 heavy vehicles per day on Bylong Valley Way, between Wollar Road and the Golden Highway intersection. Based on the Project Year's modelled in the revised TTIA, Project-related traffic flows will contribute an average of 6.3% and 4% to the background traffic flows for light and heavy vehicles respectively. During steady state operations (i.e. underground only phase), it is anticipated that between 6-7 light vehicles per day and 1-2 heavy vehicles per day would travel on the Bylong Valley Way between the Golden Highway and Wollar Road. The various assessments undertaken have confirmed that the road network will continue to operate with a good level of service with plenty of ample capacity.

KEPCO is committed to a number of upgrade works on existing roads and intersections and to build new roads and intersections as required. All of the identified required road works as a consequence of the Project are required within the MWRC LGA. Road upgrades include the widening of Upper Bylong Road between Bylong Valley Way and the open cut Mine Infrastructure Area (MIA), the realignment of Upper Bylong Road to the east, a new access road from Upper Bylong Road to the underground MIA and the improvements to the existing driveway access from Bylong Valley Way to the proposed WAF.

KEPCO is aware that MSC is the appropriate roads authority for the 40 km section of Bylong Valley Way to the east of the Kerrabee Range.

Based on the revised TTIA and an additional assessment according to MSC's submissions, KEPCO deems that there is no reason to enter into a VPA with the MSC. However, KEPCO would seek to reach an agreement for an appropriate road maintenance 'payment for damage' contribution for the peak construction activities to be negotiated with the MSC based on the results of the proposed 'before' and 'after' dilapidation inspections.

KEPCO remains committed to minimising the potential safety risks to other road users as a result of Project-related traffic. To this end, KEPCO will:

- Require the drivers of oversize or over-mass heavy vehicles travelling from the east to formulate a Journey Management Plan which utilises the Golden Highway, Ulan Road and Wollar Road route to the Project;

- Make a financial contribution to assist MSC in the remediation of the road delineation and road signage issues (as recently identified within the Road Safety Audit) on its 40 km section of Bylong Valley Way prior to construction phase 1. This proposed financial contribution will be proportionate to the predicted increase in traffic movements on this section of Bylong Valley Way as a consequence of the Project; and

- Monitor and report on Project-related traffic distributions on the regional road network at key stages throughout the life of the Project to verify the assumptions utilised within the revised TTIA.

We trust this response addresses the issues raised in the MSC submission. Should you have any queries in relation to this letter, please contact me on 6575 2000.

Yours faithfully
HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

G

Response to Environment Protection Authority Submission

28 June 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to NSW EPA Submission, Dated 9 May 2016

1. INTRODUCTION

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367.

This letter has been prepared to respond to the NSW EPA letter of 9 May 2016 to Department of Planning and Environment (DP&E) over the RTS.

2. RESPONSE TO NSW EPA SUBMISSION

2.1 AIR QUALITY – DIESEL EMISSIONS

Issue 1 - Estimation of Diesel PM and Assessment of Impacts

The RTS has estimated a nominal change in PM10 emissions from haul trucks by removing the assumed 85% suppression from diesel PM10. The RTS advises that removing the 85% suppression increases PM10 by less than 3% and concludes that there would be no change to assessment results.

Notwithstanding any methodological assumptions made in the proponent's estimation of diesel PM10 from haulage, the EPA advises that two critical issues have been overlooked in the RTS emission estimation.

1. The RTS emission comparison is presented for PM10 emissions. However, in reality the mean mass particle size for diesel PM is closer to PM1. Therefore, comparison and evaluation of potential impacts would be better suited to consideration of PM2.5 emissions.

The exhibited air quality assessment estimates total PM2.5 emissions (year 3) at approximately 13% of estimated PM10 emission. On this basis, where analysis is presented as a function of proportional emission change, the proportional change for PM2.5 emissions is likely to be much larger than the estimated change in PM10 emissions presented in the RTS.

2.The RTS only considers diesel PM10 emissions from haul trucks. This evaluation neglects to consider other significant diesel fuel burning equipment commonly used at mine sites such as excavators and dozers. EPA analysis of the NSW mining sector shows that haul trucks account for the largest consumption of diesel at mine sites (~60%) followed by excavators, dozers and loaders (~35% combined). Therefore, failure to account for diesel equipment other than haul trucks could alter the conclusions of the analysis presented in the RTS.

Response

As noted within Section 4.8.5 of the RTS, it is considered that adding the predicted diesel emissions represents a conservative assessment approach because the US EPA AP-42 emissions factor for coal mine emissions inventories include PM emissions from both mechanical, processed and diesel extracts. Notwithstanding this, additional modelling has been undertaken by Pacific Environment to address EPA's comments.

Emissions Calculations

$PM_{2.5}$ emissions were calculated based on the diesel usage from all mining equipment in Year 3, Year 5 and Year 9 as presented in Table C.1 of the Air Quality and Greenhouse Gas Impact Assessment (AQGHGIA) (Appendix O of the EIS) and the US-EPA Tier 2 $PM_{2.5}$ emission standard of 0.66 kg/L. **Table 1** summarises the diesel usages and associated $PM_{2.5}$ emissions.

Environ (2010) reports that approximately 70% of industrial diesel engines in Australia (as of 2008) were compliant with Tier 2 or higher. Only 9% were compliant with the more stringent US-EPA Tier 4 standards. Therefore, the use of Tier 2 emission standards to derive emission rates for a future mining operation is considered to be a reasonable and conservative approach.

Table 1
Diesel Emissions (kg/y)

Assessment Year	Diesel Usage (kL/y)	$PM_{2.5}$ emissions (kg/y)
Year 3	20,754	13,698
Year 5	29,369	19,384
Year 9	27,382	18,072

Diesel Fume Assessment – $PM_{2.5}$ Concentrations

$PM_{2.5}$ emissions were assumed to occur at the source locations identified for the relevant assessment year as shown in Figure 7.1 to Figure 7.3 of the AQGHGIA (Appendix O of the EIS). Dispersion modelling was similarly completed in the same manner described in Section 6 of the AQGHGIA.

$PM_{2.5}$ concentrations due to diesel usage were predicted for each of the relevant assessment years of the Project at all private and mine-owned receptor locations in the vicinity of the Project. These concentrations were then added to the predicted $PM_{2.5}$ concentrations from the Project-only as shown in Section 8 of the AQGHGIA.

The results for Year 3, Year 5 and Year 9 are presented in **Table 2**, **Table 3**, and **Table 4**, respectively. For comparative purposes, the $PM_{2.5}$ predictions from the EIS are also presented.

There are no sensitive receptors predicted to experience maximum 24-hour average $PM_{2.5}$ levels above the 25 $\mu g/m^3$ standard, even when the contribution from diesel and existing background concentrations are included. There are also no sensitive receptor locations predicted to experience annual average $PM_{2.5}$ levels above the 8 $\mu g/m^3$ standard even when the contribution from diesel and existing background concentrations are included.

When considering the maximum predicted 24-hour average concentrations, there are some aspects to consider when interpreting the results:

- The maximum predicted cumulative 24-hour average concentrations were calculated using a 24-hour time series for each set of results and adding the predicted concentration due to the Project-only to the existing background concentrations on the same day and calculating the maximum cumulative 24-hour average concentration over the year;

- The maximum predicted increment due to the Project-only may not occur on the same day as the results presented for the modelling completed for the EIS (that did not include a specific diesel $PM_{2.5}$ component) when compared with the results presented for this modelling that does include a specific diesel $PM_{2.5}$ component;

- The maximum predicted increment due to the Project-only may not occur on the same day as the maximum background and as such the maximum predicted increment due to the Project-only may not occur on the same day as the maximum predicted cumulative concentration; and

- For all the reasons above, although there is an increase to the maximum predicted 24-hour average $PM_{2.5}$ concentrations due to the Project-only (increment), the cumulative results are similar to those shown in the AQGHGIA as the cumulative results are driven by the existing background concentrations (that is, the background concentrations are the main contributor to total $PM_{2.5}$ concentrations). As detailed in Section 4.1.1 of the AQGHGIA (Appendix O of the EIS), $PM_{2.5}$ emissions are derived primarily from combustion processes, such as vehicle emissions, wood burning, coal burning for power generation, and natural processes such as bush fires. Fine particles also consist of transformation products, including sulphate and nitrate particles, and secondary organic aerosol from volatile organic compound emissions.

Table 2
Predicted Incremental and Cumulative Ground Level Concentrations for Year 3 for $PM_{2.5}$ ($\mu g/m^3$)

Year 3 - Including Contribution from Diesel								
ID	PM2.5							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
Impact Assessment Criteria	N/A		25		N/A		25	
Private Receptors								
4	0.3	0.4	24	24	0.0	0.0	5	5
5	0.3	0.4	24	24	0.0	0.0	5	5
17	0.6	0.7	24	24	0.1	0.1	5	5
41A	0.4	0.5	24	24	0.0	0.0	5	5
41B	0.4	0.5	24	24	0.0	0.0	5	5
42	0.4	0.6	24	24	0.0	0.1	5	5
43	0.4	0.5	24	24	0.0	0.0	5	5
44	0.4	0.6	24	24	0.0	0.1	5	5
47	0.4	0.6	24	24	0.0	0.1	5	5
49	0.4	0.6	24	24	0.0	0.1	5	5
50	0.5	0.6	24	24	0.1	0.1	5	5
53	0.7	0.9	24	24	0.1	0.1	5	5
56	1.7	2.0	24	24	0.3	0.4	5	5
57A	1.2	1.4	24	24	0.2	0.2	5	5
57B	1.2	1.4	24	24	0.2	0.2	5	5
57C	1.2	1.4	24	24	0.2	0.2	5	5
58	1.8	2.1	24	24	0.3	0.4	5	5
60[a]	3.2	4.0	24	24	0.8	1.0	6	6
61A	2.7	3.5	24	24	0.7	0.9	5	6
61B	2.7	3.5	24	24	0.7	0.9	5	6
65A[b]	3.0	3.8	24	24	0.8	1.0	5	6
63 [a]	3.2	4.0	24	24	0.8	1.0	6	6
68 [c]	2.8	3.6	24	24	0.7	0.9	5	6
69 [c]	4.6	5.7	25	25	1.4	1.7	6	6
141	0.8	0.9	25	25	0.1	0.1	5	5
146	0.3	0.4	24	24	0.0	0.0	5	5
151	0.4	0.5	24	24	0.0	0.0	5	5
158	0.4	0.4	24	24	0.0	0.0	5	5
161	0.2	0.3	24	24	0.0	0.0	5	5
162	0.2	0.2	24	24	0.0	0.0	5	5
165	0.3	0.4	24	24	0.0	0.0	5	5
168	0.2	0.3	24	24	0.0	0.0	5	5
181A	0.6	0.7	24	24	0.1	0.1	5	5
181B	0.6	0.7	24	24	0.1	0.1	5	5
181C	0.6	0.7	24	24	0.1	0.1	5	5
181D	0.6	0.8	24	24	0.1	0.1	5	5
225	0.2	0.3	24	24	0.0	0.0	5	5
226	0.2	0.2	24	24	0.0	0.0	5	5
242	0.1	0.2	24	24	0.0	0.0	5	5
292	0.2	0.2	24	24	0.0	0.0	5	5
317	0.1	0.1	24	24	0.0	0.0	5	5
348	0.2	0.2	24	24	0.0	0.0	5	5
349	0.2	0.2	24	24	0.0	0.0	5	5
Bylong Community Hall	2.9	3.7	24	24	0.7	0.9	5	6
Bylong Oval	3.0	3.8	24	24	0.8	1.0	5	6
Mine-Owned Receptors								
K1	0.6	0.8	24	24	0.1	0.1	5	5
K2	0.6	0.8	24	24	0.1	0.1	5	5
K3	0.9	1.2	24	24	0.1	0.2	5	5
K4	0.9	1.2	24	24	0.1	0.2	5	5
K5	1.4	1.8	24	24	0.2	0.3	5	5
K6	2.6	3.3	24	24	0.6	0.8	5	6
K7	2.5	3.3	24	24	0.6	0.8	5	5
K8	2.5	3.2	24	24	0.6	0.8	5	5
K9	3	3.9	24	24	0.8	1.0	6	6
K12	40.3	46.1	54	59	17.5	20.1	22	25
K13	64.2	72.2	72	78	27.2	30.8	32	35
K25	1.5	1.8	24	24	0.1	0.1	5	5

Year 3 - Including Contribution from Diesel								
ID	PM2.5							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
Impact Assessment Criteria	N/A		25		N/A		25	
K26	0.6	0.7	24	24	0.0	0.0	5	5
K10	6	7.3	25	25	1.8	2.2	7	7
K11	6.8	8.3	25	25	1.9	2.3	7	7
K14	34.5	39.2	50	53	11.6	13.3	16	18
K15	34.6	39.6	35	40	4.0	5.0	9	10
K16	29.1	34.8	33	39	4.1	5.2	9	10
K17	63.2	73.4	63	73	13.5	15.8	18	20
K18	56.2	63.9	56	64	11.6	13.6	16	18
K19	0.4	0.4	24	24	0.0	0.0	5	5
K20	0.4	0.4	24	24	0.0	0.0	5	5
K21	3.3	4.0	25	25	0.5	0.7	5	5
K22	2.2	2.7	25	25	0.3	0.4	5	5
K23	1.4	1.7	25	25	0.2	0.2	5	5
K24	0.9	1.1	24	24	0.1	0.1	5	5
K27	1.6	2.5	25	25	0.2	0.4	5	5
K28	1	1.5	25	25	0.1	0.2	5	5
K29	0.6	0.7	24	24	0.1	0.1	5	5
K130	48.4	55.4	57	61	17.3	19.7	22	24
K144	2.8	3.3	24	24	0.2	0.2	5	5
KTPHB	121.5	130.8	128	138	49.7	54.6	54	59
22	0.9	1.2	24	24	0.1	0.1	5	5

[a] Predicted to experience significant noise impacts as a result of the Project.
[b] Predicted to experience moderate noise impacts as a result of the Project and subject to discussion with KEPCO.
[c] Subject to acquisition by KEPCO.

Table 3
Predicted Incremental and Cumulative Ground Level Concentrations for Year 5 for $PM_{2.5}$ ($\mu g/m^3$)

Year 5 - Including Contribution from Diesel								
ID	$PM_{2.5}$							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
Impact Assessment Criteria	N/A		25		N/A		25	
Private Receptors								
4	0.5	0.6	24	24	0.0	0.1	5	5
5	0.6	0.7	24	24	0.0	0.1	5	5
17	1	1.2	24	24	0.1	0.1	5	5
41A	0.6	0.8	24	24	0.1	0.1	5	5
41B	0.6	0.8	24	24	0.1	0.1	5	5
42	0.8	1.0	24	24	0.1	0.1	5	5
43	0.7	0.9	24	24	0.1	0.1	5	5
44	0.7	0.9	24	24	0.1	0.1	5	5
47	0.8	1.0	24	24	0.1	0.1	5	5
49	0.8	1.0	24	24	0.1	0.1	5	5
50	0.8	1.0	24	24	0.1	0.1	5	5
53	1.1	1.3	24	24	0.1	0.1	5	5
56	1.6	1.8	24	24	0.4	0.5	5	5
57A	2	2.1	24	24	0.3	0.4	5	5
57B	1.9	2.0	24	24	0.3	0.4	5	5
57C	1.9	2.1	24	24	0.3	0.4	5	5
58	2.4	2.7	24	24	0.5	0.5	5	5
60 [a]	3.7	4.6	24	24	0.8	1.0	6	6
61A	3.5	4.4	24	24	0.7	0.9	5	6
61B	3.5	4.4	24	24	0.7	0.9	5	6
65A [b]	3.6	4.5	24	24	0.8	0.9	5	6
63 [a]	3.7	4.6	24	24	0.8	1.0	6	6
68 [c]	3.4	4.3	24	24	0.7	0.9	5	6
69 [c]	4.2	5.3	25	25	1.1	1.4	6	6
141	1.9	2.2	25	25	0.2	0.2	5	5
146	0.8	0.9	24	24	0.1	0.1	5	5
151	1.3	1.5	24	24	0.1	0.1	5	5
158	0.9	1.0	24	24	0.0	0.1	5	5
161	0.5	0.6	24	24	0.0	0.0	5	5
162	0.4	0.5	24	24	0.0	0.0	5	5
165	0.8	0.9	24	24	0.0	0.0	5	5
168	0.7	0.8	24	24	0.0	0.0	5	5
181A	1.1	1.2	24	24	0.2	0.2	5	5
181B	1	1.2	24	24	0.2	0.2	5	5
181C	1	1.2	24	24	0.2	0.2	5	5
181D	1	1.2	24	24	0.2	0.2	5	5
225	0.4	0.5	24	24	0.0	0.0	5	5
226	0.3	0.4	24	24	0.0	0.0	5	5
242	0.3	0.4	24	24	0.0	0.0	5	5
292	0.4	0.5	24	24	0.0	0.0	5	5
317	0.3	0.3	24	24	0.0	0.0	5	5
348	0.4	0.5	24	24	0.0	0.0	5	5
349	0.4	0.5	24	24	0.0	0.0	5	5
Bylong Community Hall	3.5	4.4	24	24	0.7	0.9	5	6
Bylong Oval	3.6	4.5	24	24	0.8	0.9	5	6
Mine-Owned Receptors								
K1	1.0	1.3	24	24	0.1	0.1	5	5
K2	1.0	1.3	24	24	0.1	0.1	5	5
K3	1.5	1.8	24	24	0.2	0.2	5	5
K4	1.5	1.8	24	24	0.2	0.2	5	5
K5	1.8	2.2	24	24	0.3	0.3	5	5
K6	3.2	4.1	24	24	0.6	0.8	5	5
K7	3.2	4.1	24	24	0.6	0.8	5	5
K8	3.2	4.1	24	24	0.6	0.7	5	5
K9	3.6	4.6	24	24	0.8	1.0	5	6
K12	22.9	25.9	39	41	9.5	10.9	14	16
K13	30.0	33.4	43	46	11.2	12.8	16	17
K25	6.6	6.8	25	26	0.7	0.8	5	5
K26	1.8	2.1	24	24	0.1	0.1	5	5

Year 5 - Including Contribution from Diesel								
ID	$PM_{2.5}$							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
K10	5.0	6.2	25	25	1.4	1.7	6	6
K11	5.4	6.7	25	25	1.4	1.8	6	6
K14	4.9	28.5	42	44	1.1	10.1	6	15
K15	26.8	29.7	42	44	8.5	9.5	13	14
K16	43.9	47.3	49	51	16.5	17.7	21	22
K17	65.5	67.9	69	72	23.3	24.7	28	29
K18	59.0	60.9	62	64	20.7	22.0	25	27
K19	0.8	0.9	24	24	0.1	0.1	5	5
K20	0.8	0.9	24	24	0.1	0.1	5	5
K21	162.3	167.2	165	170	56.6	59.9	61	65
K22	10.5	12.4	25	26	2.0	2.3	7	7
K23	13.9	15.4	29	30	1.9	2.2	7	7
K24	4.6	5.3	25	25	0.4	0.5	5	5
K27	5.8	7.2	26	26	0.7	0.9	5	6
K28	3.6	3.9	25	25	0.4	0.4	5	5
K29	2.0	2.1	25	25	0.2	0.2	5	5
K130	30.5	33.8	44	46	11.3	12.7	16	17
K144	4.9	5.1	25	26	1.1	1.3	6	6
KTPHB	40.6	43.0	50	52	16.3	17.7	21	22
22	1.4	1.7	24	24	0.1	0.2	5	5

[a] Predicted to experience significant noise impacts as a result of the Project.
[b] Predicted to experience moderate noise impacts as a result of the Project and subject to discussion with KEPCO.
[c] Subject to acquisition by KEPCO.

Table 4
Predicted Incremental and Cumulative Ground Level Concentrations for Year 9 for $PM_{2.5}$ ($\mu g/m^3$)

Year 9 - Including Contribution from Diesel								
ID	$PM_{2.5}$							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
Impact Assessment Criteria	N/A		25		N/A		25	
Private Receptors								
4	0.4	0.5	24	24	0.0	0.0	5	5
5	0.4	0.5	24	24	0.0	0.0	5	5
17	0.7	0.9	24	24	0.1	0.1	5	5
41A	0.5	0.7	24	24	0.0	0.1	5	5
41B	0.5	0.7	24	24	0.0	0.1	5	5
42	0.6	0.8	24	24	0.0	0.1	5	5
43	0.5	0.7	24	24	0.0	0.1	5	5
44	0.6	0.7	24	24	0.0	0.1	5	5
47	0.6	0.8	24	24	0.0	0.1	5	5
49	0.6	0.8	24	24	0.1	0.1	5	5
50	0.6	0.8	24	24	0.1	0.1	5	5
53	0.8	1.0	24	24	0.1	0.1	5	5
56	1.1	1.3	24	24	0.2	0.3	5	5
57A	1.4	1.6	24	24	0.2	0.3	5	5
57B	1.4	1.6	24	24	0.2	0.3	5	5
57C	1.4	1.6	24	24	0.2	0.3	5	5
58	1.4	1.6	24	24	0.3	0.4	5	5
60 [a]	2.5	3.3	24	24	0.4	0.6	5	5
61A	2.4	3.2	24	24	0.4	0.5	5	5
61B	2.5	3.3	24	24	0.4	0.5	5	5
65A [b]	2.5	3.3	24	24	0.4	0.6	5	5
63 [a]	2.6	3.4	24	24	0.4	0.6	5	5
68 [c]	2.4	3.2	24	24	0.4	0.5	5	5
69 [c]	2.8	3.8	24	24	0.6	0.9	5	6
141	2.1	2.2	25	25	0.3	0.3	5	5
146	1.1	1.2	24	24	0.1	0.1	5	5
151	1.3	1.5	24	24	0.0	0.1	5	5
158	0.9	1.0	24	24	0.0	0.1	5	5
161	0.6	0.7	24	24	0.0	0.0	5	5
162	0.5	0.6	24	24	0.0	0.0	5	5
165	0.8	0.9	24	24	0.0	0.0	5	5
168	0.6	0.7	24	24	0.0	0.0	5	5
181A	0.9	1.0	24	24	0.1	0.2	5	5
181B	0.9	1.0	24	24	0.1	0.2	5	5
181C	0.9	1.0	24	24	0.1	0.2	5	5
181D	0.9	1.0	24	24	0.1	0.2	5	5
225	0.4	0.5	24	24	0.0	0.0	5	5
226	0.3	0.4	24	24	0.0	0.0	5	5
242	0.3	0.3	24	24	0.0	0.0	5	5
292	0.4	0.5	24	24	0.0	0.0	5	5
317	0.2	0.3	24	24	0.0	0.0	5	5
348	0.4	0.5	24	24	0.0	0.0	5	5
349	0.4	0.4	24	24	0.0	0.0	5	5
Bylong Community Hall	2.5	3.3	24	24	0.4	0.5	5	5
Bylong Oval	2.5	3.3	24	24	0.4	0.6	5	5
Mine-Owned Receptors								
K1	0.8	1.0	24	24	0.1	0.1	5	5
K2	0.7	0.9	24	24	0.1	0.1	5	5
K3	1.1	1.4	24	24	0.1	0.1	5	5
K4	1.1	1.4	24	24	0.1	0.1	5	5
K5	1.4	1.8	24	24	0.2	0.2	5	5
K6	2.4	3.1	24	24	0.4	0.5	5	5
K7	2.4	3.1	24	24	0.4	0.5	5	5
K8	2.4	3.1	24	24	0.3	0.5	5	5
K9	2.5	3.4	24	24	0.4	0.6	5	5
K12	10	12.4	27	29	3.5	4.6	8	9

Year 9 - Including Contribution from Diesel								
ID	$PM_{2.5}$							
	24 hour				Annual			
	Maximum Increment		Maximum Cumulative		Maximum Increment		Maximum Cumulative	
Units	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel	EIS	EIS + Diesel
Impact Assessment Criteria	N/A		25		N/A		25	
K13	8.1	10.7	27	29	3.0	4.3	8	9
K25	3	3.4	24	24	0.2	0.3	5	5
K26	1.9	2.2	24	24	0.1	0.1	5	5
K10	3.2	4.3	24	25	0.7	1.0	5	6
K11	3.3	4.5	24	24	0.7	1.0	5	6
K14	2.7	8.2	28	29	0.4	4.0	5	9
K15	7.5	9.2	28	29	3.2	4.0	8	9
K16	6.1	8.2	29	30	2.9	3.7	8	8
K17	6.3	9.0	28	30	2.7	3.7	7	8
K18	6.1	8.6	28	30	2.7	3.6	7	8
K19	0.6	0.7	24	24	0.1	0.1	5	5
K20	0.6	0.7	24	24	0.1	0.1	5	5
K21	8.8	9.2	29	30	4.3	4.8	9	10
K22	11.3	12.4	25	25	3.0	3.3	8	8
K23	13.8	15.0	27	28	3.1	3.6	8	8
K24	8.3	8.8	24	24	0.6	0.7	5	5
K27	22.1	23.8	34	35	4.0	4.3	9	9
K28	4.9	5.5	26	26	0.8	0.8	5	6
K29	2.1	2.2	25	25	0.2	0.2	5	5
K130	7.3	9.5	28	29	3.3	4.5	8	9
K144	2.7	3.2	25	24	0.4	0.5	5	5
KTPHB	7.7	11.1	28	29	3.1	4.3	8	9
22	1.1	1.5	24	24	0.1	0.1	5	5

[a] Predicted to experience significant noise impacts as a result of the Project.
[b] Predicted to experience moderate noise impacts as a result of the Project and subject to discussion with KEPCO.
[c] Subject to acquisition by KEPCO.

Monte Carlo Assessment

The Monte Carlo assessment (assessment of cumulative 24-hour averge PM impacts) as presented in Section 8 of the AQGHGIA (Appendix O of the EIS) has been repeated here for predicted 24-hour average $PM_{2.5}$ concentrations to include contribution from diesel for receiver 69 as the closest non-mine owned receiver within the assessment. KEPCO has since acquired this property as a result of the predicted significant noise impacts resulting from the Project.

Figure 1 to **Figure 3** show the predicted cumulative 24-hour $PM_{2.5}$ concentration for receiver 69 compared with the existing background for Years 3, 5 and 9 of the Project respecitvely. These figures demonstrate that there is a very low probability for the occurrence of any additional days where cumulative $PM_{2.5}$ concentrations would be greater than the relevant criteria. Further, there are no additional days predicted to exceed the 24-hour standard than that shown in the AQGHGIA (Appendix O of the EIS).

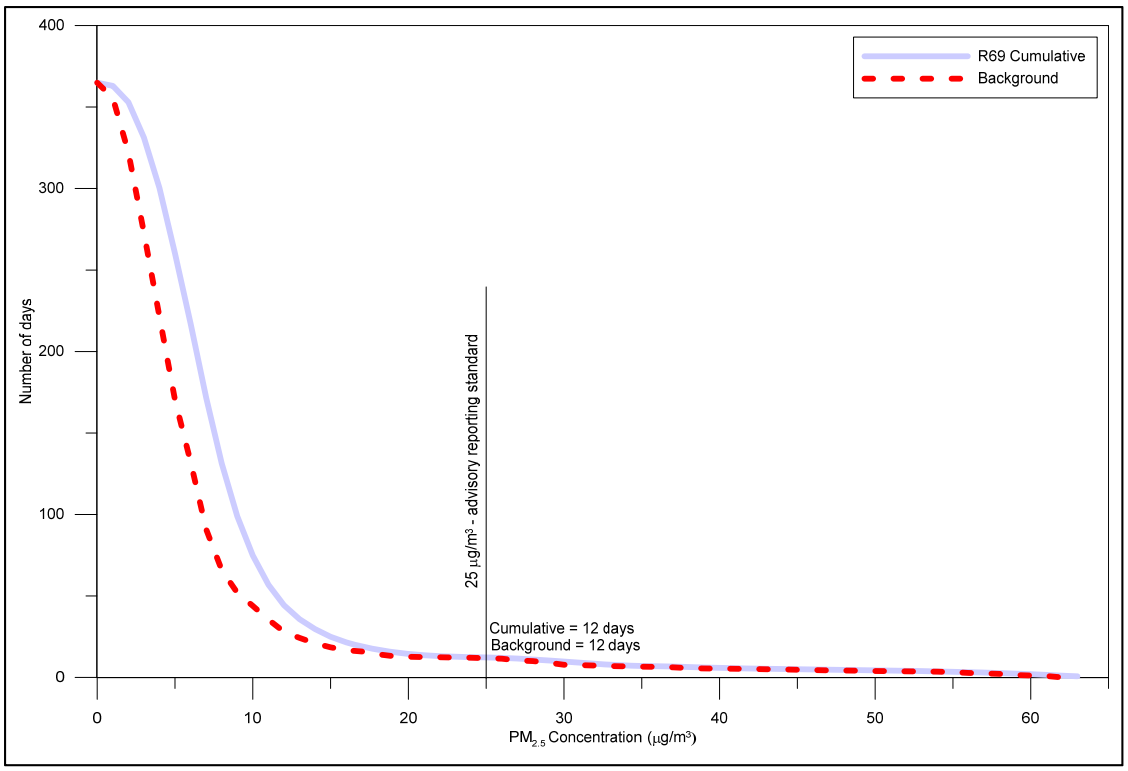


Figure 1

Year 3 – Predicted Days over 24-hour Average $PM_{2.5}$ Concentrations including Contribution from Diesel

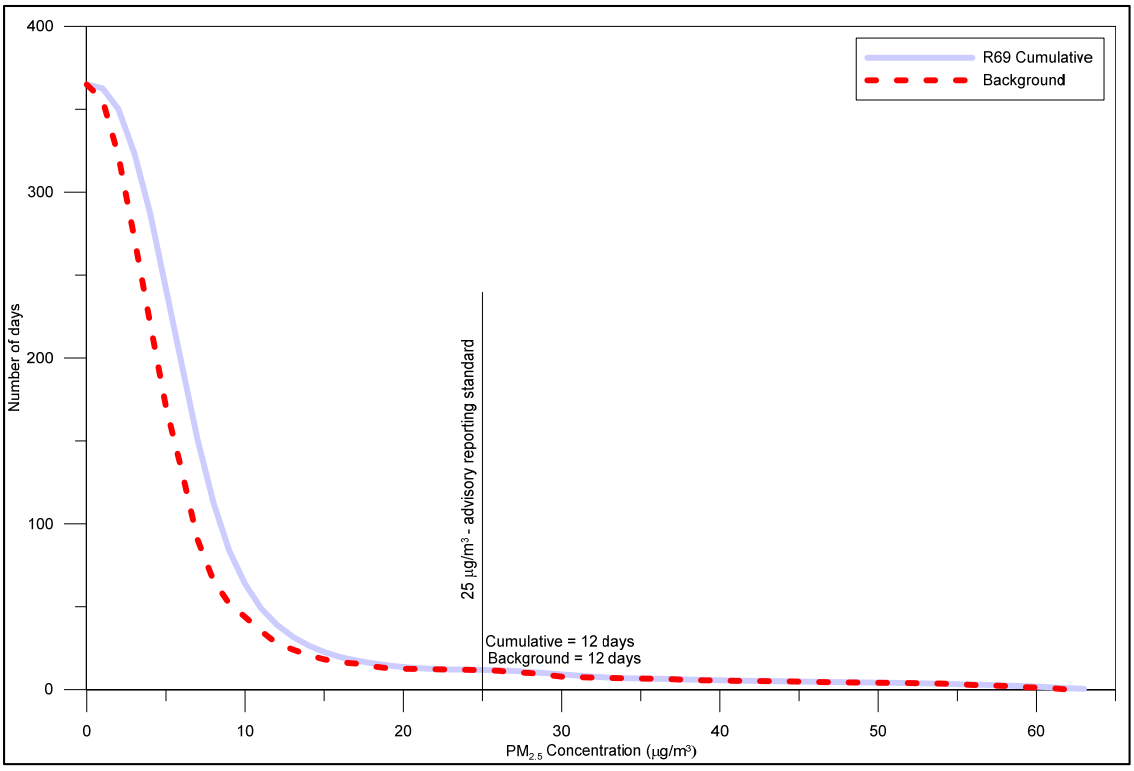


Figure 2

Year 5 – Predicted Days over 24-hour average $PM_{2.5}$ Concentrations including Contribution from Diesel

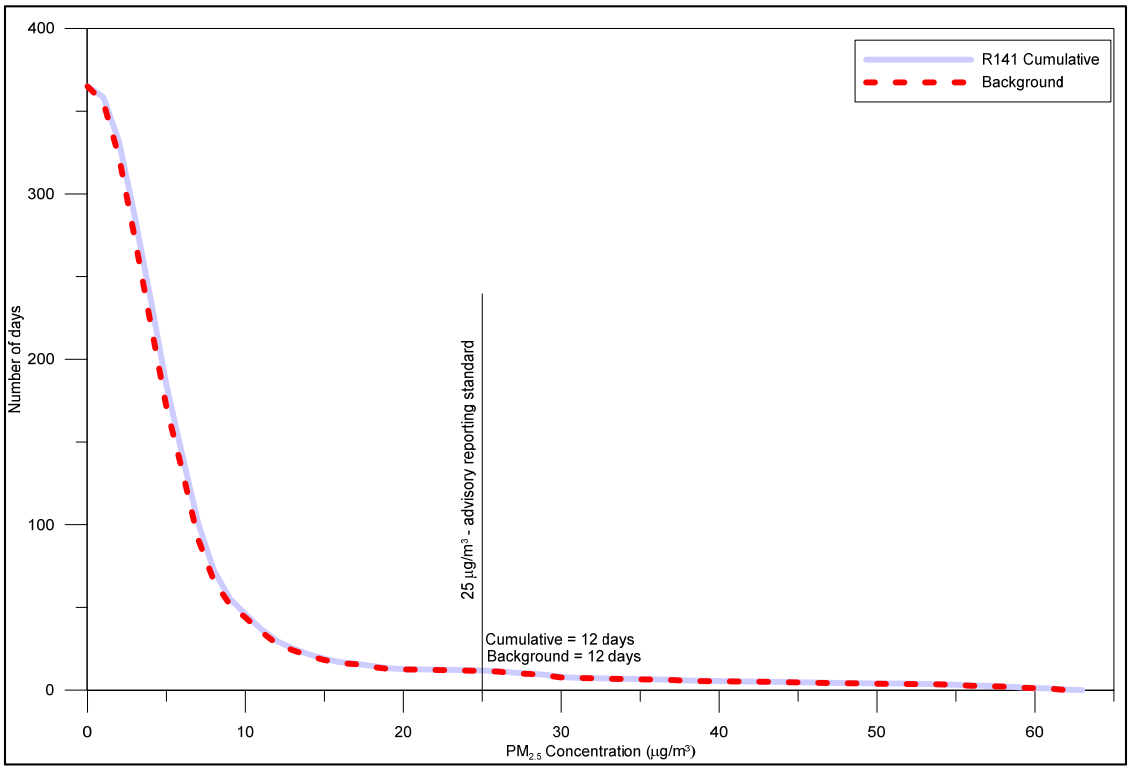


Figure 3
Year 9 – Predicted Days over 24-hour average $PM_{2.5}$ Concentrations including Contribution from Diesel

Conclusions

The likely effects on predicted $PM_{2.5}$ concentrations for the Year 3, Year 5 and Year 9 worst case scenarios has been investigated utilising the conservative inclusion of additional $PM_{2.5}$ emissions from diesel.

The results show a small increase in the maximum incremental 24-hour average $PM_{2.5}$ concentrations for all years at sensitive receptors, when compared to the results presented within the AQGHGIA. However, a smaller change is anticipated to the cumulative results as these are driven by the existing background concentrations. There were no sensitive receptors predicted to exceed the $PM_{2.5}$ 24-hour average or annual average criteria.

A Monte Carlo assessment was also completed at the closest non-mine owned receptor (receiver 69) (now owned by KEPCO) to include the contribution of diesel for predicted 24-hour average $PM_{2.5}$ concentrations. This assessment for all Project years showed no additional days where the criterion is predicted to be exceeded compared to that shown in the AQGHGIA (Appendix O of the EIS).

Issue 2 - Approaches to Minimising Diesel PM Emissions

The proponent has advised that they are cognisant of legislative requirements and that equipment will be maintained in a proper and efficient condition.

The RTS does not evaluate or nominate reasonable and feasible controls for diesel PM. The EPA reiterates requirements to minimise particle emissions via the use of best practice measures. The EPA's analysis, NSW Coal Mining Benchmarking Study Best-practice measures for reducing non-road diesel exhaust emissions (EPA, 2015) indicates that there are reasonable and feasible control measures available to reduce diesel PM emission which the proponent has failed to consider.

Response

As explained in Section 4.8.5 of the RTS, the Project is unlikely to result in adverse air quality impacts to neighbouring private residences. This is also the case for impacts due to diesel emissions as is presented above. Accordingly, KEPCO remains cognisant of its obligations under Section 128 of the *Protection of the Environment Operations Act 1997* and will ensure that its equipment remains maintained and operated in a proper and efficient manner.

KEPCO has made substantial modifications to its proposed mining operations and committed to the inclusion of additional attenuation on equipment to ensure that adverse noise impacts to neighbouring private receivers as a result of the relatively short term open cut mining operations are avoided and/or minimised to the maximum extent possible. These modifications to minimise adverse impacts of the Project come at significant costs (both from a financial and a practical mine planning sense).

EPA is seeking KEPCO to justify why further controls should not be applied on aspects which have been assessed to result in impacts less than the relevant criteria. The proposed open cut mining operations are relatively short term in nature and will be undertaken by mining contractors utilising available equipment (with relevant additional noise controls applied). The short duration of the open cut operations does not justify the acquisition of new equipment incorporating best practice technologies. Further, due to the remoteness of the Project in relation to substantial residential areas, modelling has confirmed that the diesel emissions from the Project will remain below the relevant criteria. Accordingly, KEPCO does not consider this request to be reasonable.

As previously committed, KEPCO will utilise standard mining-related equipment which will be maintained and operated in a proper and efficient manner to ensure the Project does not result in unacceptable diesel emissions.

2.2 LOW FREQUENCY NOISE

Issue 1

The EPA does not support the proponent's proposal to use the Broner low frequency noise (LFN) method in lieu of the low frequency modification factor in the NSW Industrial Noise Policy (INP). The EPA notes that the application of the NSW INP is required under the Secretary's Environmental Assessment Requirements (SEARs) for the Project.

The EPA considers that a LFN criteria based solely on an overall C-weighted noise level is not suitable for application across industry types without first considering the frequency content of the noise source and justifying its appropriateness to gauge impact. Whilst the EPA notes that the proponent has made an assessment against some of the LFN criteria in the draft Industrial Noise Guideline, this document does not represent current Government policy. The proponent has not sufficiently supported an alternative approach and accordingly the EPA recommends that the NSW INP should be applied.

The EPA's previously recommended conditions of approval are based on the application of the NSW INP LFN modifying factors.

Response

The *Bylong Coal Project Noise and Blasting Assessment* (Pacific Environment 2015) (Appendix Q of the EIS), included a low frequency noise assessment using the NSW Industrial Noise Policy (NSW INP) and Broner (2011) methods, as applied in historical noise assessments for mine approvals.

The *Bylong Coal Project Noise Assessment Addendum* (the Addendum Report) (Pacific Environment 2016a) (Appendix F of the RTS) and Section 4.8.7 of the RTS included a low frequency noise assessments in consideration of the Draft Industrial Noise Guideline (Draft ING) (EPA 2015a) which provides an updated approach to low frequency noise assessment. This involved a review of predicted mine noise contributions in low frequency octave bands (63 Hz and 125 Hz). The results were compared to the Draft ING thresholds.

The NSW INP overall C - A weighted approach to determining a penalty for low frequency noise can potentially over estimate low frequency noise impacts due to the human hearing threshold of audibility and distance attenuation of sound.

When comparing the difference between the A and C weighting curves with the threshold of audibility at low frequencies (below 250 Hz), it becomes apparent that a difference greater than 15 dB(A) can readily occur without audibility of the noise. This is shown in **Figure 4**.

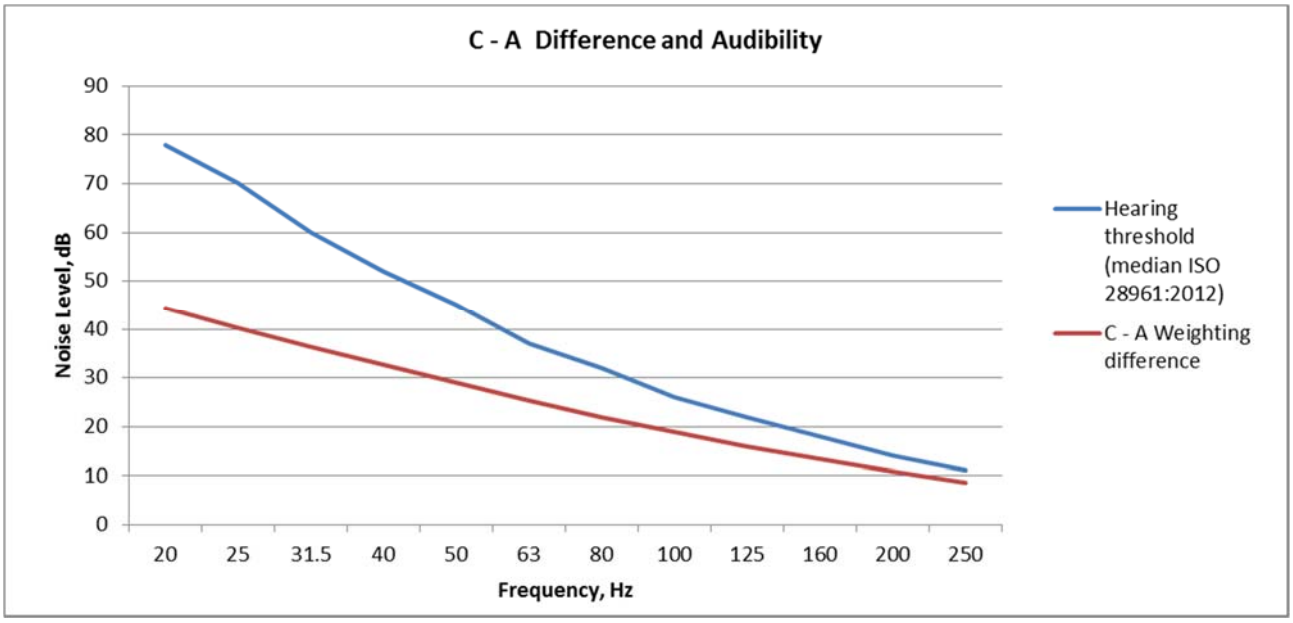


Figure 4
C - A Weighting Difference Compared to Hearing Threshold

This situation can occur when there are significant components of noise generated in lower frequencies (whether audible or inaudible) and also at large separation distances from the noise source to receiver, where atmospheric absorption attenuates higher frequency noise.

The Project would include the operation of mining equipment which includes large diesel powered mobile plant such as haul trucks, bulldozers, excavators and also a coal handling and preparation plant, all of which emit low frequency noise energy. The atmospheric attenuation of the higher frequency noise components from the Project-related equipment over distance results in a predicted difference in A and C weighted noise greater than 15 dB(A) at all receivers. The NSW INP approach does not consider whether low frequency noise components are potentially annoying and when applied to the Project, all modelled receivers would see a 5 dB penalty applied to the predicted noise level.

In response to the comment that the proponent has not sufficiently supported an alternative approach to assessing low frequency noise, a review of current Australian and international guidance and criteria on low frequency noise has been provided below. Further a comparison of historical noise monitoring data from currently operating coal mines in NSW and international criteria has been provided in the following section, with a comparison of the predicted levels of low frequency noise for the Project.

Low Frequency Noise Policy and Guidelines in Australia

The current NSW INP (NSW EPA 2000) applies a modifying correction factor based on a comparison of the A weighted and C weighted noise levels either measured or predicted at noise sensitive receivers. When C weighted noise levels are 15 dB or greater than A-weighted noise levels, a +5 dB penalty is applied.

In Victoria, the guideline *Noise from Industry in Regional Victoria* (NIRV) (Vic EPA 2011) recommends in special situations where additional protection beyond land use zoning noise criteria is required, noise levels should be limited to within 5 to 10 dB of the background noise level at each frequency octave band. However at low frequencies, greater noise levels can be acceptable due to the reduction in human hearing sensitivity at these frequencies.

In Tasmania, the *Noise Measurement Procedures Manual* (Tas EPA 2008) sets a penalty on low frequency noise applying the same approach as the NSW INP.

South Australia's (SA) *Guidelines for the Use of the Environment Protection (Noise) Policy 2007* (SA EPA, 2007) uses the C – A weighting measurement approach to identify potential low frequency noise issues, consistent with the NSW INP approach. However, the guidelines also state that an "*an objective test to identify low frequency noise has not been established by an Australian Standard*". Further commentary in *Low Frequency Noise near Wind Farms and in Other Environments* for SA EPA (Evans, T *et al*, 2013) makes reference to utilising international criteria for assessing low frequency noise.

Queensland Ecoaccess Noise Guidelines (Queensland EPA, 2004) do not apply a specific penalty to low frequency noise, although limits are applied to the low frequency 10 Hz – 160 Hz range against the overall noise limits. For dwellings, the limits for day, evening and night are $L_{pA,LF}$ 20 dB. These limits are for internal noise and apply as a weighted ten minute average level.

International Guidance and Standards

In a report for the United Kingdom's Department of Environment, Food and Rural Affairs (UK DEFRA), researchers from the University of Salford proposed a method for assessing low frequency noise. This method is described in the *Procedure for the Assessment of Low Frequency Noise Complaints* (Moorhouse et al, 2011).

Table 5 presents the low frequency noise criteria which apply to measurements made inside a dwelling.

Table 5
Low Frequency Criteria Curve

Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB, L_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34

Source: UK DEFRA NANR45 (**Moorhouse et al, 2011**).

The reference low frequency criteria curve is applicable for the night time period, and a 5 dB "relaxation" or increase may be applied for noise occurring during the daytime. A 5 dB relaxation may also be applied if the noise is steady as opposed to fluctuating. The curve is based on an average threshold of audibility up to 40 Hz and allows for some audible low frequency noise (4 – 5 dB) at higher frequencies.

The methodology presented above is broadly consistent with the national criteria in other countries such as Germany, Sweden, Denmark, Poland and the Netherlands.

The Danish EPA defines criteria based on A weighted third octave band noise levels from 10 Hz to 160 Hz inclusive as shown in **Table 6** below. The levels are assessed based on 10 minute measurements, with a 5 dB penalty applied to measured levels for impulsive noise.

German Standard DIN 45680 specifies separate low frequency and tonal criteria, on the assumption that low frequency noise from industry is generally related to tones (Leventhall, 2003). Where third octave band analysis indicates tonal noise, night time criteria are defined by DIN 45680 as illustrated in **Table 7**. This method is similar to the UK DEFRA procedure, but slightly more stringent between 63 Hz and 100 Hz.

If low frequency noise is non tonal, a night time limit of 25 dB(A) is applied as calculated over 10 Hz to 80 Hz. Only bands where the measured level is above the hearing threshold are considered in the A weighted calculation, introducing audibility into the assessment of low frequency noise.

An extract from the SA Environment Protection Authority (EPA) paper *Low Frequency Noise near Wind Farms and in Other Environments* (2013) shows a comparison between the UK DEFRA and Danish criteria and the mean hearing threshold is presented in **Figure 5**.

Table 6
Danish Low Frequency Noise Criteria (Dwellings)

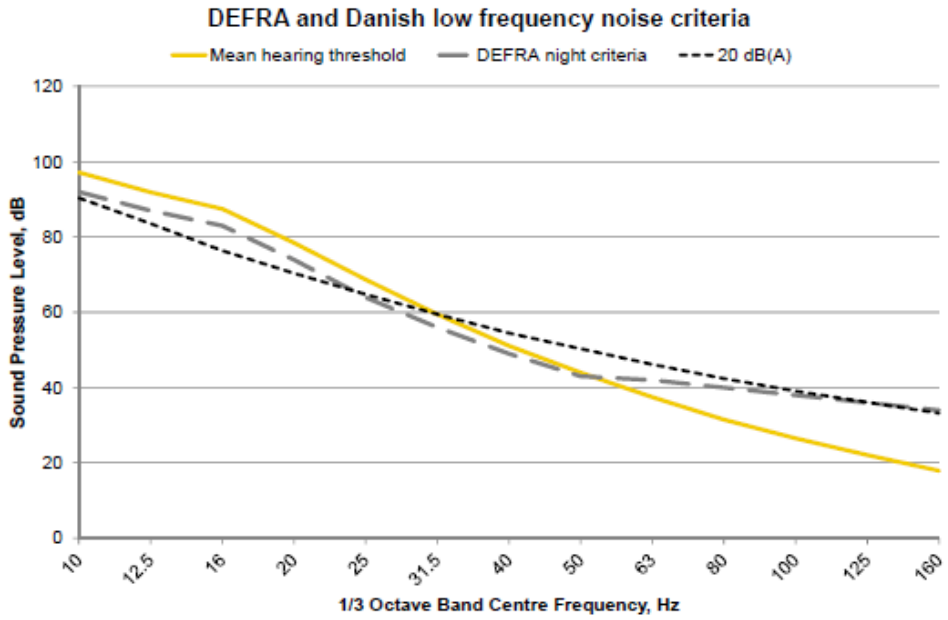
Occupancy Type	Time Period	Criterion, $L_{pA,LF}$, dB(A)
Dwellings	Day, 7.00 am to 6.00 pm	25
	Evening/ Night, 6.00 pm to 7.00 am	20

Source: Danish Environmental Protection Agency, no. 9/1997 "*Low Frequency Noise, Infrasound, and Vibrations in the Environment*".

Table 7
German Standard Night Time Criteria

Hz	8	10	12.5	16	20	25	31.5	40	50	63	80	100
dB, L_{eq}	103	95	87	79	71	63	56	48	41	34	33	34

Source: DIN 45680.



Source: SA EPA 2013.

Figure 5
Comparison of UK DEFRA and Danish Criteria to Hearing Threshold

"The DEFRA criteria sit approximately one standard deviation below the mean hearing threshold up to a frequency of approximately 40Hz. At frequencies of 50Hz and above, they recognise that people typically accept a low level of audible low frequency noise." (SA EPA, 2013).

Assessing Low Frequency Noise Impact

As indicated in the more recent noise policy and guidance currently applied in Victoria, SA and in Europe, current guidance in assessing low frequency noise impact considers audibility at low frequencies when assessing annoyance. This approach is also proposed in the Draft ING (NSW EPA 2015a).

The primary reasons for this approach to assessing low frequency noise is due to the difference between human hearing thresholds of audibility compared with the C and A weighting curves at lower noise levels than historically assessed for environmental noise annoyance. At lower overall noise levels, the C weighting curve includes inaudible components in the low frequency spectrum while the A weighted curve cuts off the audible components. This results in situations where the C-A difference may be large even though low frequency components are not apparently annoying or even audible. This affect is readily apparent when analysing the frequency data in ambient noise measurements collected in many situations with overall low noise levels. Examples include; suburban settings with low level distant traffic noise, office environments with air conditioning systems, and coastal environments with distant surf.

The *Draft Industrial Noise Guideline Technical Background Paper* (NSW EPA 2015b) provides a discussion and examples of the problems with applying the C – A approach to assessing annoyance from noise. The background paper makes particular note of the effect of distance attenuation on the difference in C – A weighted noise as higher frequency components attenuate more readily from atmospheric absorption and barrier effects, stating:

> *"This can lead to a perverse outcome where a low frequency modification may not apply near to a noise source, but will apply at more removed distances, even though the amplitude of the LFN spectrum has reduced."*

As noise is typically measured externally in NSW, the background paper (NSW EPA, 2015b) also investigates the façade attenuation of low frequency noise into dwellings for the purpose of establishing an external low frequency noise criteria. A review of research on low frequency noise attenuation through dwelling façades was presented based on studies in Australia, Denmark and North America. Correction factors were derived based on the lowest tenth percentile façade transmission loss from the measurement data.

A comparison of the low frequency noise thresholds proposed in the draft ING and the UK DEFRA criteria are presented in **Table 8**. Further to the transmission loss estimated by the NSW EPA, a comparison with a building component loss prediction calculates with the INSUL software package is also presented.

The transmission loss applied is consistent with a window of standard pane 4 mm glass partially opened for ventilation, and is expected to be a reasonable approximation of transmission loss into older dwellings. Current building construction in NSW typically use a 6 mm laminated glazing to meet the thermal insulation requirements of the Building Code of Australia.

Table 8
Comparison of Draft ING and UK DEFRA Low Frequency Noise Criteria

Source	f,Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Draft ING[1]	dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
UK DEFRA[2]	dB, L_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34
Draft ING[1] Transmission loss	Δ	0	2	3	3	5	5	5	7	8	8	10	10	10
Transmission loss[3]	-	-	-	-	-	-	-	-	7	8	9	10	11	12

Source: 1. Table C2 of the Draft ING (EPA, 2015a).
2. UK DEFRA NANR45 (UK DEFRA, 2011).
3. INSUL version 8.0.8 (noise prediction software package) 4 mm glass window partially open (approximately 5% of window area) Transmission loss spectral data is not available for frequencies below 40 Hz.

Mining Spectral Contributions in Historical Monitoring

Historically, low frequency noise has been assessed in consideration of the NSW INP low frequency noise method, in conjunction with the Broner (2011) method. More recent monitoring reports have also included an assessment against the Draft ING low frequency noise methodology.

Recent environmental noise compliance monitoring reports were reviewed to identify typical low frequency 1/3 octave noise spectra. Information was reviewed from the following mines:

- Liddell Coal Operations;
- Muswellbrook Coal Company;
- Bulga Coal Complex; and
- Mangoola Coal Operations.

A selection of measurements where a low frequency noise contribution was identified as audible were collated for comparison. The monitoring reports measured noise in the A weighted spectrum with a 20 dB lower limit, monitoring results below 63 Hz were typically not available for comparison. Measurements where other significant noise sources (such as road traffic) potentially contributed to the measured noise levels have been excluded.

The 1/3 octave band data has been estimated from the $L_{Aeq,\ 15min}$ monitoring data and converted to linear dB(Z)-weighted noise levels for comparison with UK DEFRA criteria. The results of this comparison are presented in **Figure 6** and provide examples of typical low frequency impacts measured around similar operational mines. Note that in this graph, the UK DEFRA criteria for internal areas has been converted to external criteria based on standard building construction transmission loss data.

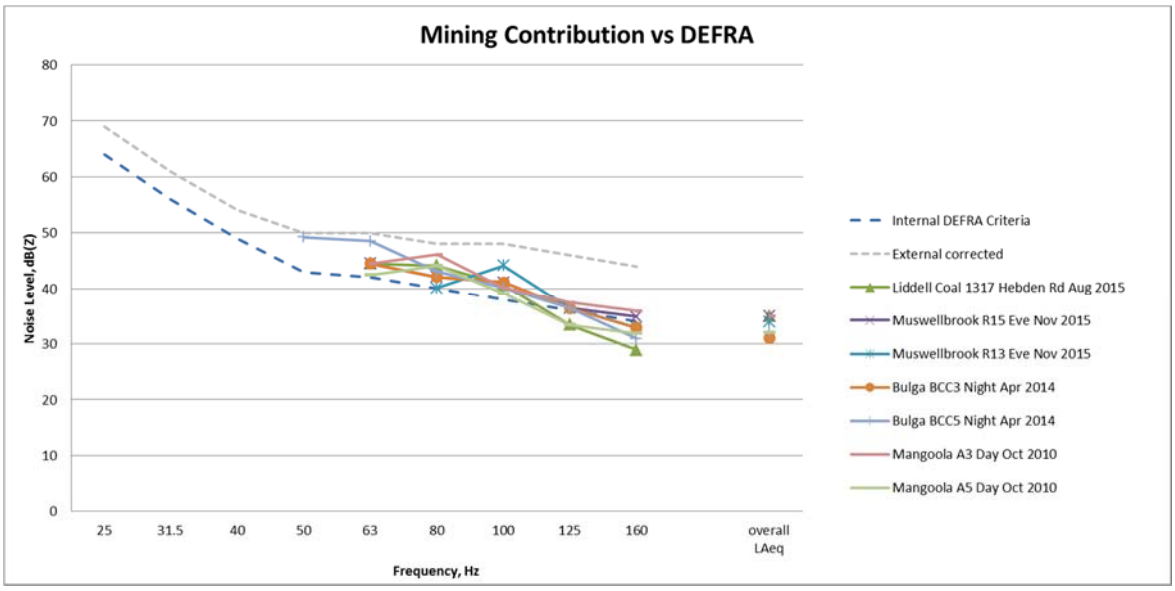


Figure 6
Historical Mining Contributions Compared to UK DEFRA Criteria

The comparison demonstrates that external noise levels generated by mining operations as recorded at neighbouring receivers would comply with the UK DEFRA low frequency criteria when the criteria has been corrected for transmission loss.

Monitoring data has been referenced for sites with similar background environments to the Project with minimal extraneous noise sources.

Project Noise Predictions

While the Draft ING method is not currently enforced noise policy (as indicated by the EPA in its submission), it is based on the UK DEFRA assessment method which is consistent with recent European noise policy and research. Applying the INP approach would result in a low frequency penalty being applied to all receivers without consideration of the limitations of this method.

The results presented in the *Noise Assessment Addendum* (Appendix F of the RTS) are external noise levels for the 63 Hz and 125 Hz octave bands.

The results indicate that the UK DEFRA low frequency noise thresholds (when corrected for internal to external transmission loss) would exceed the 63 Hz band at receiver 69 under calm day and night time conditions during Year 3 operations.

UK DEFRA states that a 5 dB relaxation or increase may be applied for noise occurring during the day time, therefore values during the day period would be below relevant thresholds. Including a 5 dB penalty, noise levels during Year 3 calm night time conditions would be 45 dB(A).

Noise levels also exceed the 63 Hz threshold at this receiver (69) for Year 5 under meteorological conditions 2 and 3 (refer Appendix B of the Addendum Report (Appendix F of the RTS)). Including the 5 dB relaxation for noise occurring during the day time period, noise levels values during the day period would be below relevant thresholds.

Low frequency noise thresholds are also identified as being exceeded at receiver 69 for Year 5 under meteorological conditions 6, 7, 9 and 10 (refer Appendix B of the Addendum Report (Appendix F of the RTS)), however the difference between L_{Ceq} and L_{Aeq} noise levels is less than 15 dB.

Receiver 69 has been identified as receiving significant residual noise levels as presented in the Addendum Report (Appendix F of the RTS). It should be noted that KECPO has recently reached the relevant agreement for the acquisition of this property. No other private receivers were identified as exceeding the UK DEFRA criteria when corrected for mitigation.

Conclusions

Current international research and noise assessment guidance recommends that low frequency noise impacts should be assessed with consideration of audibility and potential annoyance depending on the frequency and noise level.

This approach is applied in European noise criteria and has been adopted in recent guidance in Australia. Accordingly, the UK DEFRA approach to assessing low frequency noise has been applied to the Project with consideration to internal transmission loss.

The predicted impacts did not exceed the criteria with the exception of receivers already identified to receive significant noise impacts from the Project.

2.3 SURFACE WATER

Issue 1 – Site Water Balance

The EPA notes the RTS and EIS generally commits the Project to being "nil discharge" from mine water storages during the mining, with discharges from sediment dams occurring during wet weather events. As such, should approval for the Project be granted by the DPE, the EPA will not licence any discharges from mine water storage dam/s which may occur during the period of mining. The proponent will therefore be required to ensure it can comply with the requirements of the Protection of the Environment Operations Act 1997 (the POEO Act) should any releases from mine water storages occur.

The RTS and EIS site water balances' indicate that water remaining in the final open cut void/s upon completion of mining will be pumped to the underground mine workings. Given potential uncertainties in water quality and quantity in the final void/s at the completion of mining (a period of some 20 years), the EPA considers that a decision regarding appropriate management measures for such water should be assessed and determined during mine closure planning. The pumping of water from the final void to the underground workings may require licensing by the EPA.

Response

Noted.

As explained within Section 7.4.3 of the EIS, the simulated water balance modelling indicates that under the modelling assumptions and configuration for the Project, there are no uncontrolled spills from the mine water management system. However, it is noted that some overflow of water is predicted to occur from sediment dams during wet periods which exceed the relevant design standard of the sediment control system.

An Environment Protection Licence (EPL) will be sought for the Project under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPL may be modified to include the discharge of water from the site as required.

KEPCO will consult with EPA during the mine closure planning phase of the Project to determine the licencing requirements for the pumping of surplus mine water to the underground mine workings at the completion of proposed mining operations.

Issue 2 – Sediment Basins

> *The EPA notes that sediment dams are proposed to be sized as "Type F" sediment basins with a settling zone volume based on the 90th percentile 5-day duration rainfall at Scone which the RTS provides is consistent with recently approved Maules Creek Coal Mine and the Watermark Coal Project. While this may be the case, coal mines and quarries throughout central west NSW are generally licensed to have sediment basins with a settling zone volume based on the 95th percentile 5-day duration rainfall, for example, the recently approved Moolarben Coal Mine Stage 2. The EPA considers this conservative approach assists with ensuring compliance with the conditions of the EPL which relate to the management of the basins.*
>
> *In regards to discharges from sediment basins, water quality discharge limits and conditions relating to monitoring and the management of sediment dams would be included in an environment protection licence, should the Project be approved by DPE.*

Response

Noted. As explained within Section 4.8.12 of the RTS, the adopted methodology for sizing of sediment dams detailed in the Surface Water Impact Assessment (Appendix L of the EIS) is consistent with current design guidelines (Managing Urban Stormwater, Soil and Construction, Volume 2E Mines and Quarries (DECC, 2008)). The guideline specifies a settling zone volume based on 90th percentile 5 day rainfall for standard receiving environments and 95th percentile for a ‘sensitive’ receiving environment. A ‘sensitive’ receiving environment is one that has a high conservation value, or supports human uses of water that are particularly sensitive to degraded water quality.

The adopted methodology is also consistent with standard practice applied across NSW for other mining and industrial sites. Whilst the EPA suggests that Moolarben Coal Mine has accepted a more stringent EPL condition to manage its sediment laden water, requiring the adoption of the 95th percentile rainfall would increase the size of the sediment dams for the Project by more than 50%, for no significant environmental benefit. Accordingly, KEPCO does not accept this more stringent requirement.

KEPCO will seek the relevant EPL for the Project under the POEO Act which will incorporate the discharge locations as required.

Issue 3 – Clean Water Diversions

It is noted that a key objective of the water management system will be to maximise the diversion of clean water flows around the mining operations. From a site inspection of the Project area previously undertaken by the EPA, the extent of the slope the hill to the northeast of the CHPP was noted.

All figures in the EIS which illustrate the CHPP and underground MIA do not include an indication of any proposed clean water diversions for these areas of the Project. The EPA notes the commitment made in the RTS to the installation of a clean water diversion drain around the rail loop, CHPP and the underground MIA.

Response

Noted. As indicated in the RTS, Figure 30 of the EIS illustrates the clean water drain around the rail loop and CHPP area.

Issue 4 – Waste Water

Section 3.7.6 of the EIS provides that the design capacities of the three sewage treatment facilities are 33, 33 and 60 kl/day which are located at the open cut and underground MIA's and at the WAF. This information is confirmed in the RTS.

The EPA notes from the RTS that uncertainty remains as to how wastewater from the underground and open cut MIAs will be managed. The options considered are offsite disposal, onsite irrigation and reuse.

Given the space constraints of the underground MIA and the proximity of the open cut MIA to surface waters, the EPA considers that offsite disposal should be further investigated. In relation to the WAF, effluent management should be designed and managed in accordance with the Environmental Guideline for the Use of Effluent by Irrigation (DEC 2003).

Response

Noted. During the detailed design phase, KEPCO will give further consideration to offsite disposal of waste water and will continue to consult with and provide any required information to EPA on this matter.

3. CONCLUSION

We trust this response addresses the issues raised in the NSW EPA submission. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

H

Response to Heritage Council of NSW Submission

BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

3 June 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Steve,

Bylong Coal Project EIS
Response to NSW Heritage Council Submission, Dated 9 May 2016

1. INTRODUCTION

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367.

This letter has been prepared to respond to the NSW Heritage Council letter of 9 May 2016 to Department of Planning and Environment (DP&E) over the RTS.

As a general observation, KEPCO submits that, as reflected in the EIS and again in the RTS, it has already considered and is committed to comprehensive and rigorous conservation management mechanisms for the conservation of the historic built and archaeological sites on its lands. In this regard, as a precise of that consideration and commitment, reference is made to the RTS at Sections 4.2.13 (response to submission by MWRC), 4.10 (response to submission by the NSW Heritage Council), and 5.15 (response to Stakeholder Issues – Historic Heritage).

KEPCO submits that the last paragraph on page 60 of the RTS encapsulates and is a concise statement of its commitment to the sound and practical conservation management of its heritage assets. The key guiding Policy that underpins this regime is the Burra Charter.

2. RESPONSE TO NSW HERITAGE COUNCIL SUBMISSION

2.1 BUILT HERITAGE

Issue 1

The Heritage Division notes that there is no statutory requirement for the proponent to seek inclusion of the identified heritage items in the Heritage Schedule of the Mid-Western Regional Local Environmental Plan 2012 (LEP). However considering the extent of proposed demolition and adverse impacts to Bylong's historic landscape, further consultation with Mid-Western Regional Council is strongly recommended to ensure that the heritage values of the surviving heritage sites are protected.

Response

Noted.

As discussed in Section 4.2.13 of the RTS, KEPCO has committed to ongoing consultation with the Mid-Western Regional Council (MWRC).

KEPCO is currently investigating the feasibility of potentially relocating the former Catholic Church, the Public School buildings, the Upper Bylong Hall and the former Post Office/Store. There are many factors influencing the potential feasibility to relocate the buildings, including structural condition and transportability.

The buildings have been the subject of structural engineering and survey advice to establish their structural integrity to withstand the rigours of removal. This engineering and technical advice has been prepared to inform KEPCO in relation to the ongoing management of its property assets and is an essential contribution to the decision-making about removal and potential practical adaptive reuse of the buildings. These matters are addressed in Section 5.15.5 of the RTS.

The Council and key stakeholders will be engaged again as soon as the structural and survey advice is received and their feedback will continue to be sought regarding the removal and potential relocation of the key buildings.

Issue 2

The Response to Submissions notes that Conservation Management Plans (CMPs) will be prepared for key properties owned by the proponent, including maintenance schedules, however the sites have not been identified. It is strongly recommended that CMPs are prepared for all of the heritage sites that are likely to be impacted by the project (except those that will no longer exist following demolition).

Response

Section 5.15.2, first paragraph on page 398 of the RTS identifies the heritage sites located on KEPCO land that are likely to be impacted by the Project and will be subject to Conservation Management Plans (CMPs).

A Historic Heritage Management Plan (HHMP) will be prepared to guide the management of all potentially impacted heritage items not subject to demolition. These include: Homestation, Bylong Station Farm Complex, , Harley Hill Farm Complex, Bylong Trig Station, Swiss Cottage, Bylong Hall, Tarwyn Park Farm Complex and Cottage Chimney Remains.

As part of the HHMP, CMPs have been proposed for the larger, more complex heritage items on KEPCO land which meet multiple significance criterion where greater management detail is required. They are Homestation, Bylong Station Farm Complex and Tarwyn Park Farm Complex.

Issue 3

> *It is understood that an Interpretation Plan for the broader Bylong Precinct will be prepared as part of the Historic Heritage Management Plan (HHMP), following approval of the SSD. We recommend that the requirement for an Interpretation Plan is included in the consent conditions. The Plan should be referred to the Mid-Western Regional Council for comment and implemented as part of the project.*

Response

Noted. This recommendation is consistent with item 18 within Table 41 Revised Project Management and Monitoring Measures of the RTS.

As a component of its ongoing engagement with Mid-Western Regional Council, KEPCO will be liaising with the Council during the preparation of the Interpretation Plan and considers the Plan as part of the Project.

2.2 HISTORICAL ARCHAEOLOGICAL SITES AND IMPACTS

Issue 1

> *The response to submissions notes that the management of the Renfrew Park remains 1 and 2 will be included in the Historic Heritage Management Plan (HHMP) for the project. It is recommended that further investigation of the Renfrew Park Remains 1 and 2 is included in the consent conditions and that any investigation occurs prior to the commencement of the project.*

Response

As outlined in Section 10.7 of the Historic Heritage Impact Assessment (HHIA) in the EIS and Section 4.10.5 of the RTS, a historical archaeological assessment will be undertaken for Renfrew Park Remains 1 and 2 to determine if locally significant relics are present. This will be undertaken prior to any impacts to these sites. If it is assessed that locally significant relics are present, these items will be subject to a relevant level of archaeological excavation and recording, prior to any impact occurring.

Issue 2

> *A program of archaeological excavation and recording prior to impact has been proposed for the Cheese Factory and potentially the Renfrew Park remains 1 and 2. It is recommended that the conditions of consent include a condition stating that all archaeological excavations are conducted in accordance with a research design and method in accordance with Heritage Councils' best practice publications including 'Assessing Historical Archaeological Sites and Relics' and 'Archaeological Assessments' and submitted to the Heritage Council or its delegate for review and that all excavations are completed by an Excavation Director suitably qualified according to the Heritage Council Criteria for the Assessment of Excavation Directors.*

Response

Noted.

For matters that would attract Archival Recording and excavation of historical archaeological material requiring the involvement of an Excavation Director, KEPCO would, as a matter of course, comply with applicable statutory requirements as well as following those Policies and Guidelines together with the Burra Charter.

Issue 3

> *It is also noted that the final location of the Our Lady of the Sacred Heart Catholic Church and the location of reburial of known and potential burials have not been confirmed. It is recommended that the confirmation of these details should be a condition of consent.*

Response

Technical investigations into the structural integrity of the former church building are underway. KEPCO is continuing its consultation to determine if there is any local interest in relocating the former church building.

As stated in Section 4.10.6 of the RTS, the arrangements for the potential relocation of the former church building will be determined in consultation with the various relevant stakeholders, including MWRC. If it is deemed technically feasible to relocate the building and there is genuine interest in such an exercise, including an ongoing commitment to utilising and maintaining it, then KEPCO will meet the cost of its relocation to an agreed location within the local area.

In relation to the relocation of remains of those buried in the Cemetery, the direct descendants of the known burials have indicated their preferences for where their ancestors are to be reinterred. Discussions are well underway with the respective authorities to facilitate the settlement of necessary relocation arrangements.

3. CONCLUSION

We trust this response addresses the issues raised in the NSW Heritage Council submission. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist

Response to Timnath Pty Ltd Submission

BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

1 July 2016

Team Leader
Planning Assessment
22-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Stephen O'Donoghue

Dear Stephen,

Bylong Coal Project EIS
Response to Timnath Pty Ltd Submission dated 6 May 2016

1. BACKGROUND

The '*Bylong Coal Project Environmental Impact Statement*' (EIS) which supported Development Application (SSD) 14_6367 for the Bylong Coal Project (the Project) was placed on public exhibition between 23 September and 6 November 2015.

Hansen Bailey prepared the document '*Bylong Coal Project Response to Submissions*' (RTS) dated 23 March 2016 to address comments received from agencies and other stakeholders during the exhibition of the EIS. The RTS included responses to the Timnath Pty Ltd submission dated 4 November 2015 in relation to groundwater impacts at the Budden property.

Timnath Pty Ltd provided a further letter dated 6 May 2016 to the Department of Planning and Environment (DP&E) over matters raised in previous correspondence. This letter has been prepared to respond to Timnath Pty Ltd comments within their letter to DP&E dated 6 May 2016.

2. RESPONSE TO TIMNATH PTY LTD SUBMISSION

2.1 GROUNDWATER

ISSUE 1

I am very concerned about the impact KEPCO's of proposed Coal Mining operation of the water at "Budden".

Response

As noted in Section 5.9.5 of the RTS, the predicted impacts to groundwater from the Project do not extend to the Budden Property for all scenarios modelled, including extreme condition scenarios.

The presence of the Growee Range between the Project and the Budden property has a significant influence on the impacts predicted by the numerical groundwater model for the Project. Historical weathering of the coal seam in the vicinity of the alignments of the Bylong River, Lee Creek and the Growee River has removed sections of the primary coal seams proposed for mining. This indicates that there is no direct connectivity for water to travel through the coal seam between the proposed mining areas and the properties west of the Growee Range (including the Budden Property). The drawdown within the Permian and Triassic units therefore did not extend to these areas to the west.

The Groundwater Impact Assessment (Appendix M of the EIS) also did not predict the zone of drawdown within the Bylong River alluvium to extend from the Project and to move approximately 8 km upstream from the Bylong River confluence through the Growee River alluvium. Hence the predicted impacts do not extend to the Budden Property for all scenarios modelled.

With the implementation of a monitoring program and associated trigger levels within the Water Management Plan (WMP) for the Project, KEPCO would therefore be able to appropriately respond to any unforeseen impacts before the bores located on the Budden Property are adversely affected by the Project.

ISSUE 2

What immediate steps the proponent would take to provide adequate quantities of uncontaminated water to affected neighbouring landholders in order for them to continue their primary production activities (NB this has been the legal right of the landholders for many years and of Timnath for in excess of 40 years).

Response

As noted in the response to Issue 1 above, the groundwater modelling undertaken for the Project has indicated that the bores located on the Budden Property will not be affected.

The WMP will detail the monitoring program to be implemented to identify the impacts of the Project on the regional groundwater regime. The WMP will outline trigger levels to which the monitoring data will be analysed against. If these trigger levels are exceeded, further investigations will take place to confirm the reasons for the exceedance and identify any response required. The trigger levels will be established to ensure that monitoring will identify any unforeseen drawdown impacts to the alluvial aquifer as a result of the Project, before any neighbouring landholder bore is adversely impacted.

It is noted that groundwater modelling has shown that if the Project were to impact neighbouring privately owned bores, it is likely that this would be in a period of prolonged drought when less water recharge occurs to the system. Water availability for irrigation activities within the Bylong Valley during these prolonged dry conditions would therefore be reduced even in absence of the Project.

As explained in Section 7.6.4 of the EIS and Section 4.3.1 of the RTS, should groundwater monitoring indicate that the Project has resulted in changes in groundwater levels and quality more extensively than predicted at any privately owned bore, then mitigation measures will be discussed with the landholders. This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project. It is noted however that it is highly unlikely that any such impact will be experienced at the Budden Property as a consequence of the Project.

Issue 3

> *What medium to long term steps the proponent would take to rectify the causers) of the disturbance to the supply of uncontaminated water to neighbouring landholders in accordance with their entitlements.*

Response

Refer to the response to Issue 2. The WMP will outline the monitoring program which will be used to identify the impacts of the Project on the groundwater regime. The WMP will include trigger levels which will be utilised to identify unforeseen impacts to the groundwater regime as a result of the Project prior to impacts occurring to neighbouring landholder bores.

Issue 4

> *What medium to long term steps the proponent would take to remediate any environmental damage resulting from disturbance to the continued enjoyment of existing water entitlements of neighbouring landholders.*

Response

KEPCO will assist to remediate any environmental damage which has been caused directly by the Project through the loss of water from neighbouring privately owned landholdings.

Issue 5

> *What compensation for economic and non-economic loss the proponent would make to the affected landholders resulting from their disturbance of their existing water entitlements, and how such compensation would be assessed, and, in the event of dispute in that regard, determined*

Response

As noted above and in Section 4.3.1 of the RTS, should monitoring indicate the Project has resulted in changes in groundwater levels and quality more extensive than predicted at any privately owned bore, then KEPCO will discuss potential mitigation measures with the landholder. This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project.

Issue 6

> *How the proponent's compliance with each of the above issues would guarantee and secured in the future. (emphasis added)*

Response

Within both the EIS and RTS documents, should monitoring indicate the Project has resulted in changes in groundwater levels and quality more extensive than predicted at any privately owned bore, then KEPCO will discuss potential mitigation measures with the landholder. This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project. As such, KEPCO would accept a condition of Development Consent along these lines.

Issue 7

> *At page 85 of the Kepco "Response to Submissions on Groundwater" in clause 7.2.1 the proponent states: -*
>
> *..... Compensatory water supply measures will provide an alternative supply of water that is equivalent to the loss attributable to the mine development. Equivalent water supply will be provided as soon as practicable from the loss being identified as a result of the Project, unless otherwise agreed with the landowner. The Water Management Plan will set out the process by which potential impairment of landholder bores will be assessed and compensatory arrangements in the form of make good agreements. "*

There is no reference in the Kepco Response to where the extra water may be obtained and it is certainly, to my knowledge, not available at the site. Further, Kepco is not recognising any of the "time factors" involved in negotiating, purchasing, transporting, delivering and storage on site. It must be recognised that at all times live cattle must have water to drink and stock feed must have water to grow. Cattle being without water, even for one day, is catastrophic and the Kepco Response is silent on this issue.

Response

As explained in Section 4.3.12.1 (and Section 7.2.1 of Appendix H) of the RTS, the WMP will include further information in relation to the establishment of make good agreements between KEPCO and the landholders whose bores are considered to potentially be impacted by the Project, or are not predicted to be impacted but remain within relatively close proximity to the Project. KEPCO will include within any make good agreement, the appropriate timing requirements for short and medium term resolutions to supplementing any water impacts. Section 7.2.1 of Appendix H of the RTS provides examples of how an appropriate compensatory water supply could be provided as well as other financial compensations. These items will be considered within any make good agreement.

It is noted that KEPCO's landholdings front a considerable proportion of the Bylong River, Lee Creek and Growee River alluvial aquifers. This affords KEPCO the opportunity to construct additional bores (subject to relevant water licences) to provide further access to groundwater in the instance it is required for the Project or to supply water to affected neighbouring landholders.

Issue 8

At page 79 of the Kepco Response to Groundwater" in the last paragraph it states: -

" ... there is some uncertainty at a local level due to the groundwater flow being controlled by varying extents by observed intra- and inter-formational heterogenerity in the rock units. Dipping beds, faulting and igneous intrusionsal influence groundwater and hydraulic gradients. "

The "uncertainity" referred to on page 79 of the Kepco Response causes real doubt as to the practicality of the mine. The "uncertainty" of water is identified over and over in the Kepco Response including on page 67, 79 and 80.

Response

Sensitivity and uncertainty analyses have been completed for the groundwater modelling in order to identify the sensitivity of the assumptions utilised within the modelling and to assess uncertainty scenarios using reasonable worst case assumptions (such as assessing no recharge to the alluvial aquifer). Therefore, there is certainty that real world outcomes will fall within the values identified for the extreme cases within the model.

These modelling predictions have determined that the Project will not adversely impact upon the water supply to the Budden Property.

Issue 9

The Kepco Groundwater Response makes a vague reference to "Make Good Agreements" which Kepco proposes to enter into with affected landholders AFTER the mine has been approved (Kepco Groundwater Response at Part 7.2.1 at page 85 - 86). Such a proposal is included at the end of the Kepco Groundwater Response and is without detail.

If the mine is approved, the bargaining power between landholders and Kepco will significantly favour Kepco and the terms of any such agreement are, at this time uncertain. No one could claim that the proposed "Make Good Agreements" do anything to address the concerns raised in the Timnath Submissions (detailed above) because Kepco do not state with any certainty what will occur, and when, if a landholder loses their water.

It should be a requirement that BEFORE the mine is approved that Kepco enter into an enforceable agreement with Timnath and other landholders that specifically address the concerns raised in the Timnath Submissions (detailed above). Specifically, what Kepco will do, and when, if a landholder loses their water at any stage after the mine is approved.

Response

As noted above and within the EIS and RTS documents, should monitoring indicate the Project has resulted in changes in groundwater levels and quality more extensive than predicted at any privately owned bore, then KEPCO will discuss potential mitigation measures with the landholder. This may include the implementation of "*make good provisions*" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project. As such, KEPCO would accept a condition of Development Consent along these lines.

Issue 10

Finally, we note that Kepco state at, Part 7.2.1 on page 85 of the Kepco Groundwater Response, that: -

"During this consultation, KEPCO has agreed to install electronic data loggers to record groundwater levels at surrounding properties including "Budden ... . "

There is no agreement between Kepco and Timnath to install electronic data loggers to record groundwater levels at "Budden". Rather, Timnath has undertaken this work itself without any assistance from Kepco.

Response

The proposed extension of KEPCO's groundwater monitoring network to neighbouring properties was a direct result of feedback received from Bylong property owners / property managers during face-to-face meetings held in late 2015. Specifically during a meeting on 28 October 2015 (attended by the Budden property manager), potential groundwater impacts of the Project on neighbouring properties activities were identified as a key area of interest to the participating landholders / property managers. As an outcome of the meeting, KEPCO was willing to satisfy the property owners / property managers' requests to conduct monitoring of groundwater on the neighbouring properties, including the Budden Property. Hence the reason for this statement within the RTS.

KEPCO accepts that Timnath Pty Ltd has commenced its own monitoring since the meeting in October 2015. Consequently, KEPCO understands that the groundwater monitoring previously sought from KEPCO on the Budden Property are no longer requested by Timnath Pty Ltd.

Issue 11

> *Given the above, we request that Kepco be required to address the concerns in the Timnath Submissions, as detailed above, in detail and enter into an enforceable agreement to protect the water on Budden BEFORE the mine is approved.*

Response

Noted.

A summary of the key responses presented throughout this document include:

1. The predicted impacts to groundwater from the Project do not extend to the Budden Property for all scenarios modelled;

2. KEPCO will prepare and implement a WMP which will include a monitoring program to verify modelling results and ensure that unforeseen impacts are identified prior to private landholders bores being adversely impacted;

3. Should monitoring indicate the Project has resulted in changes in groundwater levels and quality more extensive than predicted at any privately owned bore, then KEPCO will discuss potential mitigation measures with the landholder. This may include the implementation of "make good provisions" to compensate for any adverse impacts to neighbouring landholder bores determined to be a result of the Project. As such, KEPCO would accept a condition of Development Consent along these lines; and

4. KEPCO does not consider it appropriate to enter into "make good agreements" prior to the determination of Development Consent for the Project. However, as previously committed to Timnath Pty Ltd, KEPCO is willing to arrange a meeting to provide clarity over the modelling work which has been undertaken and to explain why no impacts are predicted to any water source on the Budden property.

3. CONCLUSION

We trust this response addresses the issues raised in the Timnath Pty Ltd submission. Should you have any queries in relation to this letter, please contact us on 6575 2000.

Yours faithfully

HANSEN BAILEY

James Bailey
Director

Nathan Cooper
Senior Environmental Scientist